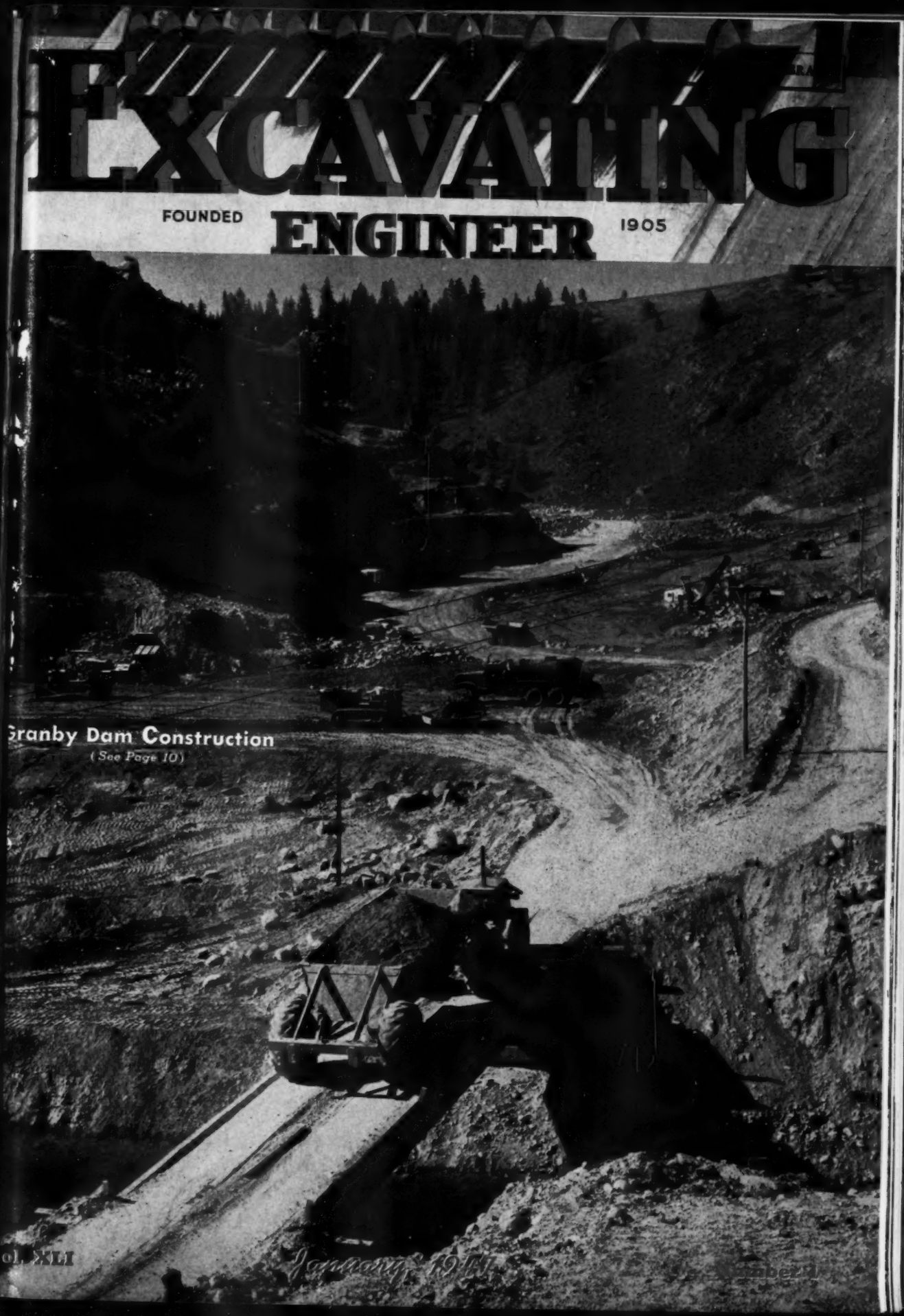
EXCAVATING ENGINEER

FOUNDED 1905



Granby Dam Construction

(See Page 10)

ol. XLI

January, 1947 Number 1

. . . More About the "BIGGER DIGGER"

The "Bigger Digger," so named by its owner, is the Bucyrus-Erie 1150-B walking dragline with which International Mineral & Chemical Corp. strips overburden and digs phosphate at its Peace Valley Mine in Florida. Here are a few quick facts about the 1150-B.

● Its big-area base provides ample bearing area, and the design is such that the center of gravity is maintained within the swing circle, keeping rim pressures at a minimum, maintaining maximum ground contact and helping to eliminate coning.

● The smooth, rolling-cam walking action permits moving easily over soft or rough ground — side-stepping in any direction to avoid trouble — quickly attaining the most advantageous working position.

● Effective digging action, fast hoisting, quick-starting and quick-stopping swings — these all contribute to a rapid operating cycle, which means more passes every hour, more work done every day!

"Bigger Digger" is one of the distinguished family of Bucyrus-Erie and Bucyrus-Monighan walking draglines noted for leadership in difficult jobs all over the world. They are available with booms to 250 feet and buckets to 25 cubic yards.

The Bucyrus-Erie 1150-B walking dragline, "Bigger Digger," has a 215-foot boom and a 20-cubic yard bucket.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

EXCAVATING ENGINEER

FOUNDED 1905

CONTENTS

Vol. XLI **January 1947** No. 1

January Advertisers

Allied Steel Products, Inc. 40
American Steel Dredge Co., Inc. 3
Bethlehem Steel Co. 2
Blaw-Knox Company 41
Bucyrus-Erie Co. .....2nd Cover 9, 23, 35, 45
Colorado Fuel & Iron Corporation, The Wickwire Spencer Steel Div. 39
Dart Truck Company 4
Erie Steel Construction Co. ... 48
Euclid Road Machinery Co., The 27
For Sale (Classified) 47-48
Gar Wood Industries, Inc., Hoist & Body division..... 31
Gatke Corporation 43
General Excavator Co., The ... 33
Heiss Manufacturing Co., Inc., George 42
Harnischfeger Corporation 38
Hayward Company, The 3
International Harvester Co. ..24-25
Ihm Co., C. R. 42
Koehring Company 28-29
LeTourneau, Inc., R. G. 6-7
Macwhyte Company 8
Moon Mfg. Co. 40
Northwest Engineering Co. 5
Osgood Company, The 33
Owen Bucket Company, The ... 45
Page Engineering Company 37
Preformed Wire Rope Information Bureau ...3rd Cover
Rogers Brothers Corporation .. 46
Sauerman Brothers, Inc. 36
Standard Oil of Cal. .....4th Cover
Templeton-Kenly & Co. 38
Timken Roller Bearing Co., The 1
Wellman Engineering Co., The.. 34
White Manufacturing Company. 3
Wickwire Spencer Steel Division, The, Colorado Fuel & Iron Corporation 39

Granby Dam—By Frank M. La Hue 10

Granby Constructors, joint venture of seven construction firms, start work on $5,988,969 contract for Granby Dam and Dikes, earthfill structures on Colorado River which, as part of the Big Thompson project, will bring 300,000 acre-feet of water annually to the dry flatlands of eastern Colorado.

Evolution of Road Making Machines 16

Road Maintenance in Harvey County, Kansas .. 18

Harvey County, Kansas, uses modern equipment to advantage in offsetting troubles caused by need of doing post-war work on a prewar budget.

Coal-handling Project 21

Tractor equipment used by Smith Construction Company on earth moving job to improve C & O's facilities for handling coal mined from the West Virginia-Kentucky "Coal Bin of America."

Ex-Laffs—By J. A. Patterson 22

Field Notes 26

Gasoline Pump 26
Rusty Pipe Cleaner 26
Disc Scraper 26
Safety Block for Dump Trucks 26

Equipment You Ought to Know About 30

Portable Heater 30
Motor Grader 30
Airco Electrode 30
FWD Model M10 30
Apron Feeder 30

Shots from the Firing Line 32

Many States to Consider Increased Gas Taxes .. 32
Columbia Basin Construction Program to be Expanded 34
Small Town Airports Will Have Their Chance .. 36
Recommend California Spend $2,246,000,000 for Roads 38
Use Scrapers in Refacing Job at Kingsley Dam .. 38
Postwar Road Construction is Started in Vermont 39
Seek 1,000-Mile Network of Ohio Superhighways 39
Predict Record Income from Auto Taxes in 1947-48 40
Oil Companies Interested in Underground Parking 41
Report Declares LaGuardia Airport Needs Repairs 42
Construction Machinery second Quarter, 1946 43

Not in the Contract 44

Notes from the Manufacturer 48

New Trade Literature 48

Published Monthly by
THE EXCAVATING ENGINEER PUBLISHING COMPANY
South Milwaukee, Wisconsin, U. S. A.

E. M. HEUSTON, Publisher
J. D. GRACE, Editor
D. B. REED, JR., Managing Editor
E. W. ARNDT, Art Editor
M. J. BARGENQUEST, Sales Manager

ECA Member Controlled Circulation Audit

Regular Subscription (payable in advance): 25 cents per copy, $2.50 a year: Canada and foreign, subject to publication policy, $3.50 per year. Special subscription: Upon written request on company letterhead this publication will be sent (not regularly) free of charge to companies, executives and supervisors engaged actively in excavating.

COPYRIGHT 1947 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

DREDGES

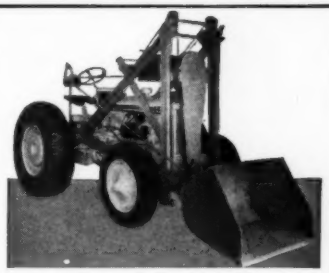
HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 - INDIANA - U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905



Front - End
LOADERS
For Industrial Tractors

Extensible Booms,
5/8-cu. Yd., Bucket 8-foot lift,
Backfiller Blades

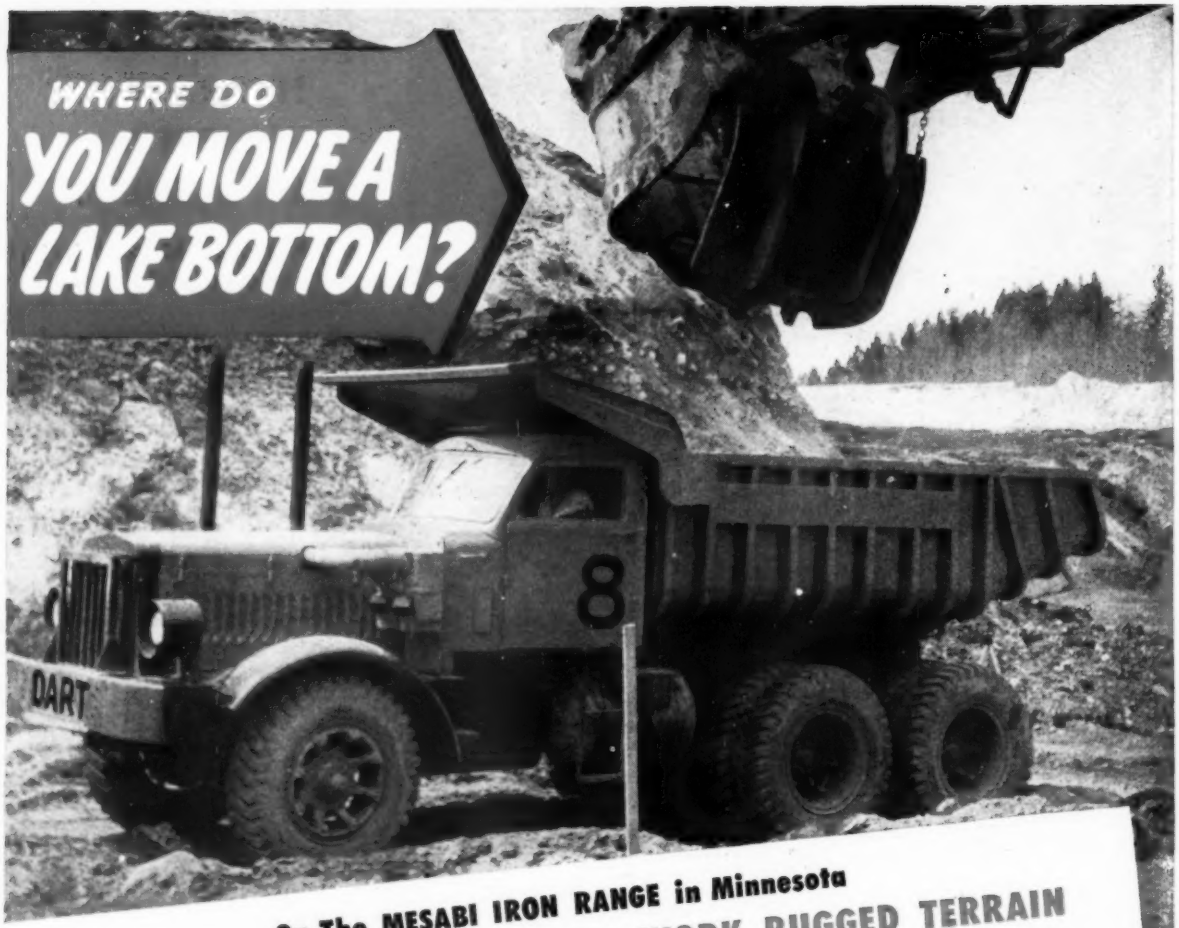
White Mfg. Co.
ELKHART INDIANA

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD CO.
52-54 Church Street
New York, N. Y.



On The MESABI IRON RANGE in Minnesota

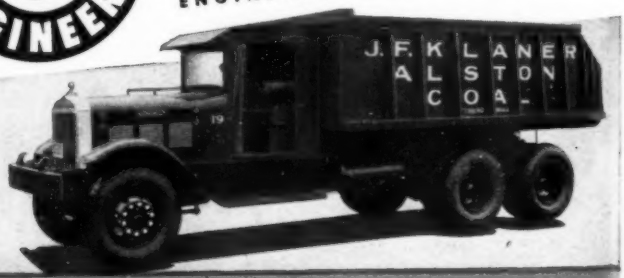
"TONNAGE ENGINEERED" DARTS WORK RUGGED TERRAIN TO TRUCK LAKE BOTTOM UP 12° GRADES 18 TONS AT A TIME

This Dart Truck, and many more like it, is doing a big job on the Mesabi. Ore from the lake bottom is lifted by these Darts to surface hoppers some of which are well over 400-ft. above pit bottom; 8° to 12° grades are common; 36000 pounds is the normal Dart load each trip.

"Tonnage Engineering" by Dart fits trucks to typical jobs such as this. Power and construction are engineered to move more tonnage per investment dollar. On or off the highway—regardless of operating conditions, Dart Trucks are engineered for 5 to 80 ton payloads.

Dart TONNAGE ENGINEERED Trucks

CONSULTATION WITH OUR ENGINEERS IS INVITED



18 YEARS IN THE PITS AND STILL PAYING OFF

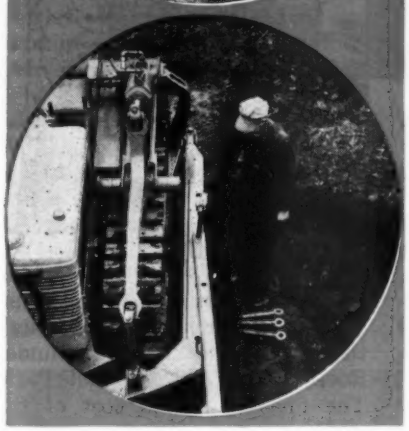
A pioneer—doing the same tough jobs as when it started work in 1929.

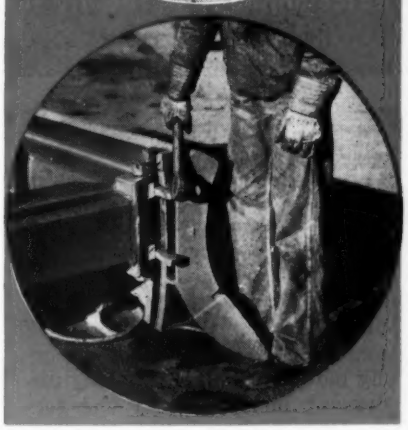
DART TRUCK COMPANY • OAK AT 27th STREET • KANSAS CITY, MISSOURI

Transf. Ltd.

ANGLING AND TILTING

that the OPERATOR Will Use!





"Sure . . . a blade angling and tilting feature can be a big help on plenty of jobs . . . but I'll be darned if I'll bother to angle or tilt if it takes a half hour to do it! I want to move dirt!" The Speaker? Almost any blade equipment operator. It's no problem to get <u>your</u> operators to use the effective angling and tilting features of Bucyrus-Erie Bullgraders, because they're both so easy to do — fast. Without tools, the operator angles the blade by pulling the landside pins, adjusting the blade to the correct angle, and replacing the pins. To tilt, he uses a landside pin to hammer out the wedges that hold the blade in position, shifts the blade to the tilt he wants, hammers the wedges back in place. Neither angling nor tilting takes more than a couple of minutes!

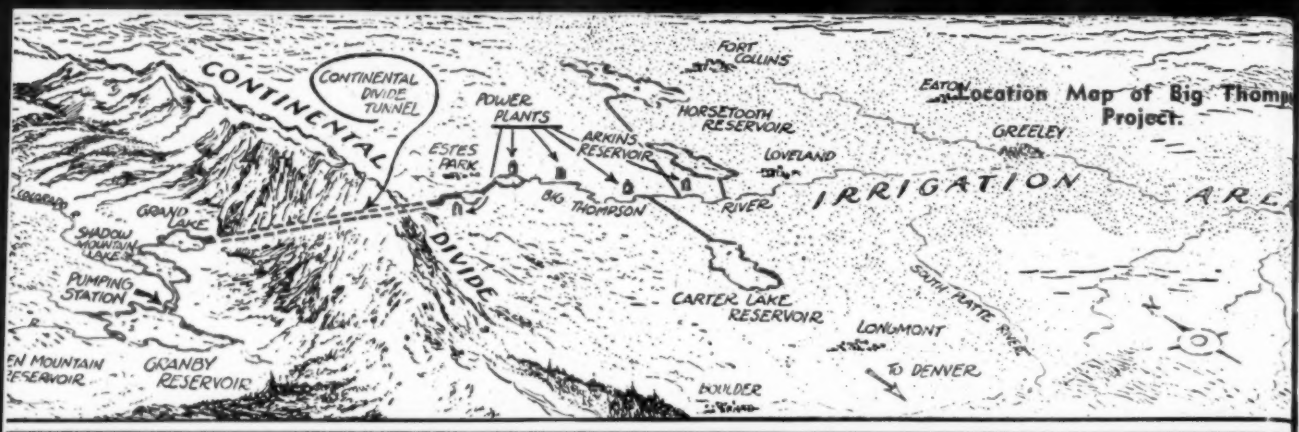
Both you and your operators will like the many other features of the Bucyrus-Erie Bullgrader, too: its easy handling through smooth hydraulic control and balanced-to-the-tractor design, its powerful digging down pressure, its complete visibility, its ability to handle so many jobs efficiently. Ask your International TracTracTor Distributor for complete details.

12T45C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR



Location Map of Big Thompson Project.

Granby Dam

Granby Constructors, joint venture of seven construction firms, start work on $5,988,969 contract for Granby Dam and Dikes, earthfill structures on Colorado River which, as part of the Big Thompson project, will bring 300,000 acre-feet of water annually to the dry flatlands of eastern Colorado.

By FRANK M. LA HUE

Location Map of Granby Dam

THE VITAL IMPORTANCE of water to man and the tragic consequences of the lack of it are well understood by one who has witnessed the "Dust Bowl" period of the thirties. The suffocating cloud of dust with hot winds blasting crops and pasture, the dying stock, homeless families whose farms were literally blown away are now only unpleasant memories, for the former "Dust Bowl' is again the Grainery of the West. But in some regions of our country, the danger of drought is perpetual. In the eastern sections of Colorado, Wyoming, and Montana, and in western sections of the two Dakotas and Nebraska water is a coveted commodity. The forefathers of the hardy land-loving people of these parts fought many a bloody battle over water rights. These were followed later by court battles which are waged in our times between corporations and states as well as individuals.

The Bureau of Reclamation is coming to the relief of these drought-ridden areas by means of constructive and far-reaching engineering. In a number of vast projects it will provide for an orderly distribution of water and will also increase the available supply. In eastern Colorado the Big Thompson project, which now hinges upon the Granby Irrigation Dam, will bring through the Continental Divide a stream equal to the entire flow of the Republican River at the Kansas-Nebraska line. Now well on the road to completion, the Big Thompson will be simple in operation; but the tasks of its construction are breathtaking in their enormity. One striking example is the finished 13-Mile Alva B. Adams tunnel, nine feet and three inches in diameter, through the Continental Divide under Rocky Mountain National Park. The final estimated cost of the whole project is approximately $120,000,000, but with its output of electric current and payments for water by users, it is expected to return every dollar of its cost.

As mentioned previously, the Big Thompson project now hinges upon the Granby Irrigation Dam and Dikes 1, 2, 3, and 4, as au-

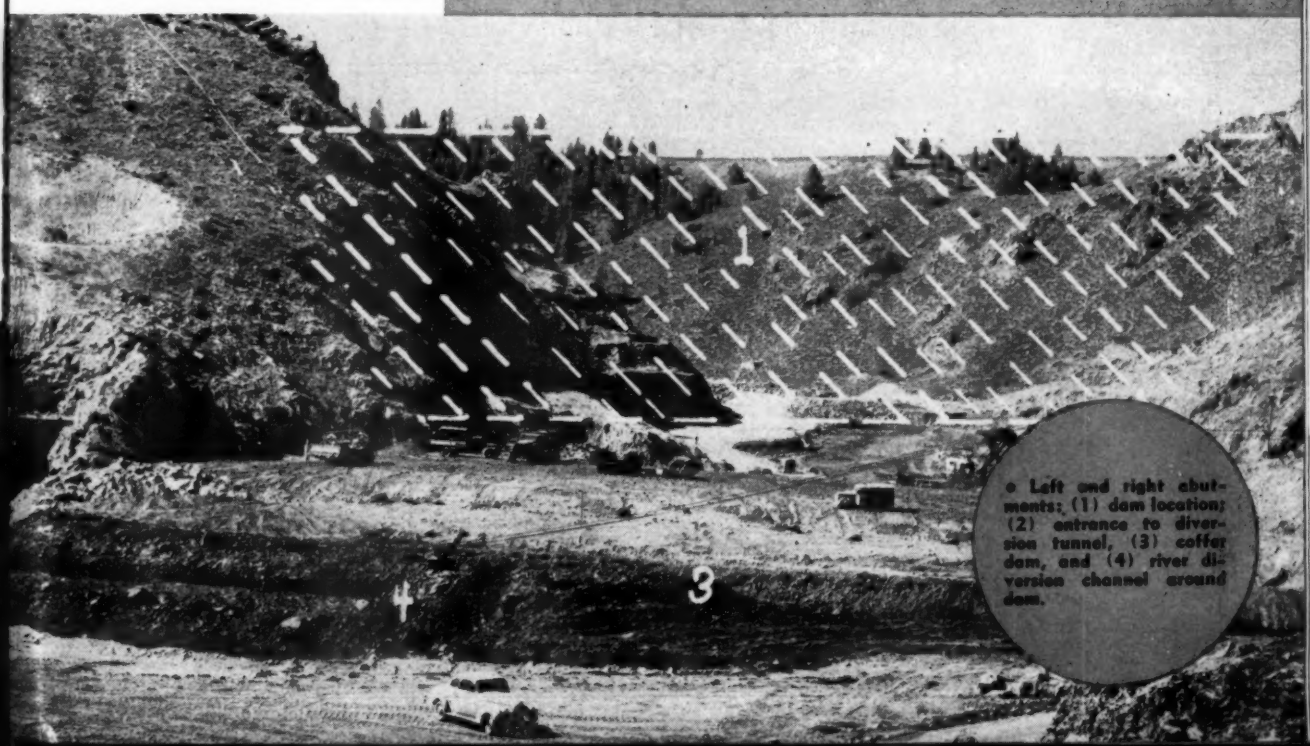
• Night view of Granby Dam location showing: (A) Bucyrus-Erie shovel at Borrow Pit No. 1; (B) Bay City working slide area; (C) coffer dam construction; (D) Lima dragline working in river bed; (E) Euclids hauling from Bucyrus-Erie shovel to coffer dam; (F) Whites and Euclids hauling from Lima to dam, and (G) Caterpillar D-8 working river bed.

thorized by the U. S. Bureau of Reclamation under the local direction of Project Manager Rex Blackwell. Granby Dam and Dike 3 are of earthfill construction and are being erected by the Granby Constructors with Ed H. Honnen, lately commander in the Seabees, as project manager. His administration includes Clayton Hoon, general superintendent; Chat Olivier, project engineer; and Bob Puryne, office manager, all located at the dam site. Gavin Honnen, purchasing agent, is located at the Denver office.

The Granby Constructors is a newly organized company made up of seven construction concerns: Peter Kiewit Sons Company, Omaha, Neb.; Grafe-Callahan Company, Dallas, Texas and Los Angeles, Cal.; Ed H. Honnen, Colorado Springs, Col.; Brown and Root, Inc., Houston, Texas; Condon Cunningham Company, Omaha, Neb.; Gunther and Shirley, Los Angeles, Cal.; and Martin Wunderlich Company, Denver, Col. This joint-venture is constructing the dam and Dike 3, while Dikes 1, 2, and 4 are being constructed by L. J. Hesser & Company, whose work will be briefly related later.

The contract was awarded May 29, 1946, and work was begun August 6, 1946. Dam and Dike 3 are to be completed February 26, 1950. The contract contains a pen-

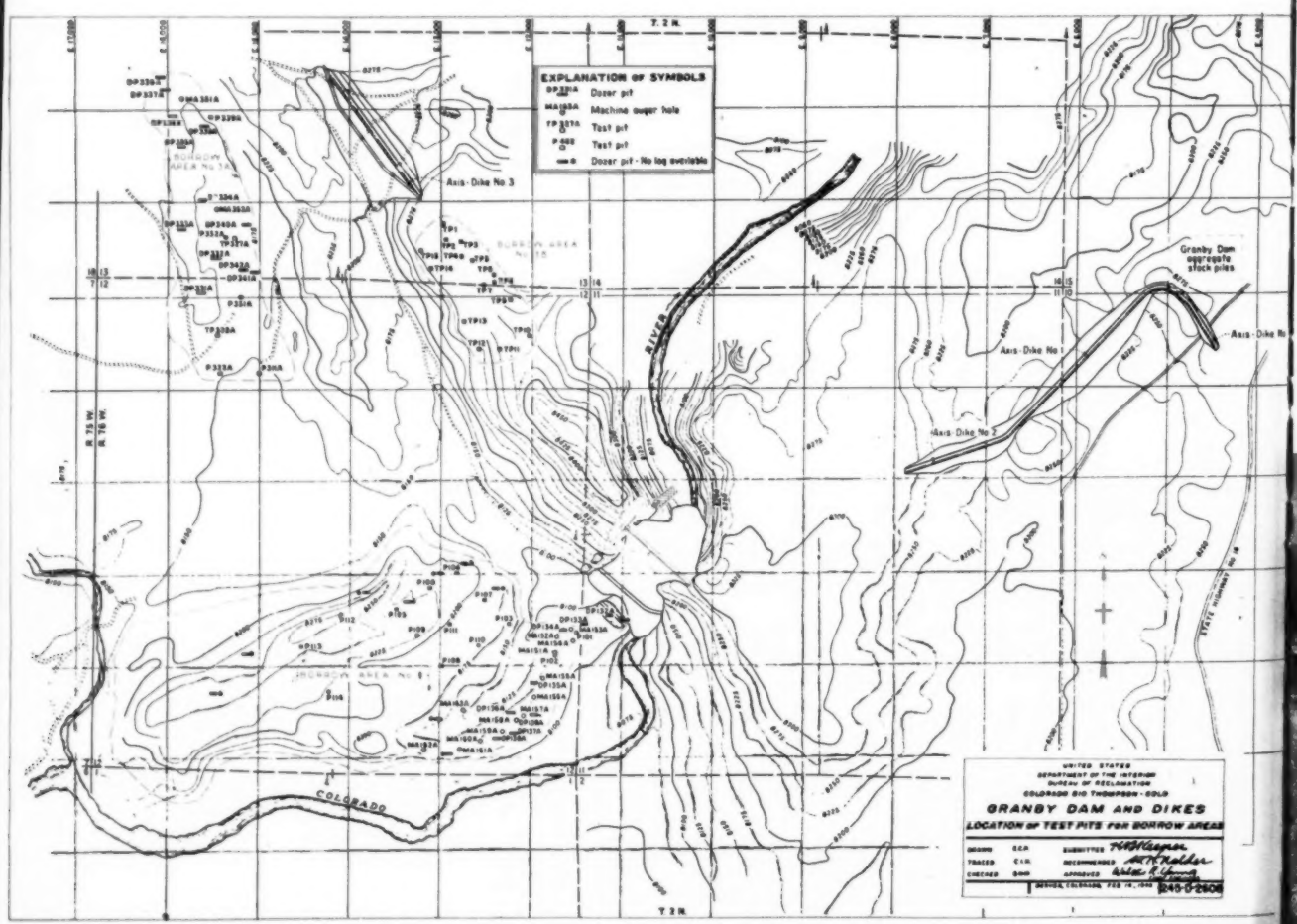
• Looking south downstream from dam site. In left foreground is exit of diversion tunnel which passes through left abutment.



• Left and right abutments: (1) dam location; (2) entrance to diversion tunnel, (3) coffer dam, and (4) river diversion channel around dam.

• Impervious material being loaded by Bucyrus-Erie 2½-cu. yd. shovel at borrow pit No. 1 into 15-cu. yd. bottom dump Euclid which, with three other Euclids, make a 1000-yd. round trip haul to the coffer dam.

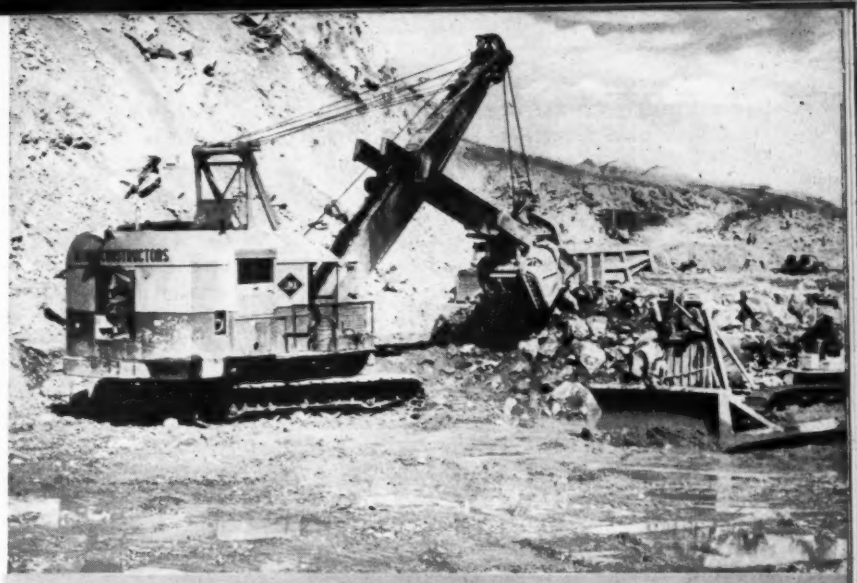
alty clause of $600 per calendar day. The amount of the contract is $5,988,969 with all materials, with a few exceptions, to be furnished by the Government at an additional cost of $5,000,000 making a total cost of approximately $11,000,000. Materials furnished by the contractor are lumber for temporary tunnel timbering if required, temporary timbering for faults in cutoff trench excavation, in faults and seams, and for strutting corrugated metal pipe; all forms; materials including absorptive form lining and oil for oiling forms; those used in vacuum concrete process, welding, rods for field welding or radial gates; all wire, wire ties, or other appliances used for holding forms and for securing reinforcement bars, metal or other temporary supports, if used, for reinforcement bars, pipe, and other metal work; all water used for mixing, cleaning, and curing concrete, for grouting operations, and for moistening embankments; materials to be compacted; all sealing compounds used for coating joints and for curing concrete; oakum or other suitable materials for calking grout and drain pipes and for plugging grout leaks; all insulating tape and compounds, solder, and flux for electrical work; and also all other materials not a part of the completed construction required for the completion of contract. The contractor is to haul all these materials as well as all the materials delivered to the contractor by the Government. The cost of hauling, stor-



ing, and handling all the materials described and furnishing all materials required furnished by contractor were included in the price bid.

The site of Granby Dam is approximately two miles downstream southwest of the junction of the north and south forks of the Colorado River, and seven miles north of Granby, in Grand County. Granby is located 87 miles northwest of Denver on Highway 40.

Completed, the dam will be 1000 feet long and 40 feet wide at the crest, and will measure 225 feet from the present stream level to the top. Its volume will be 3,200,000 cu. yds. At final elevation it will store 546,353 acre-feet of water over an area three miles long and two-and-one half miles wide, making it the largest lake in the state. A pumping plant at the dam, using current generated at the site by a hydroelectric plant, will lift water 185 feet into the next reservoir, Shadow Mountain Lake, which is to be three times the size of the popular resort Grand Lake. Shadow Mountain Lake level will regulate that of Grand Lake. The water will then flow directly into the entrance of the 13-mile Alva B. Adams tunnel which has a drop of 91 feet. At the end of this plunge it will be diverted into a power plant at eastern exit and its energy converted into electricity. From here the water will be discharged into the canyon of the Big Thompson River where the terrific drop continues, and will



• Above: Lima working river bed between left and right abutments loading glacial boulders and mica schist to Euclid to be dumped at diversionary dam ¼-mile away. The bulldozer is dozing rock to the shovel from the center of the river bed. Below: Bay City dragline working left abutment (looking downstream) slide area.

• Tournapulls loading at borrow pit No. 1 with special hook-up developed by Carl Folger, superintendent for Hesser.

pass through four more hydroelectric plants before it is allowed to rest in the three great reservoirs now being constructed for it in the foothills. These are Carter Lake Reservoir to the south of the Big Thompson channel; Horsetooth to the north; and Arkins to the north of the river bed. Here the water will be held after having generated 600,000,000 kilowatts of electric energy a year, until the dry lands to the east must have it. Then it will be released as needed to fall another 2000 feet before reaching the plains. Thus about 300,000 acre-feet of water annually will be brought to the flats of eastern Colorado.

In the dam site area the overburden averages a depth of one foot of top soil and 20 feet of clay below that. Solid rock is found from 50 to 80 feet below the stream bed. From one foot below the surface down to bed rock there is a preponderance of glacial boulders and mica schist.

The diversion of the Colorado River entailed the excavation and waste of approximately 150,000 cu. yds. in the diversion dam foundation and diversion channel and the placing of approximately 250,000 cu. yds. in permanent and temporary diversion dams.

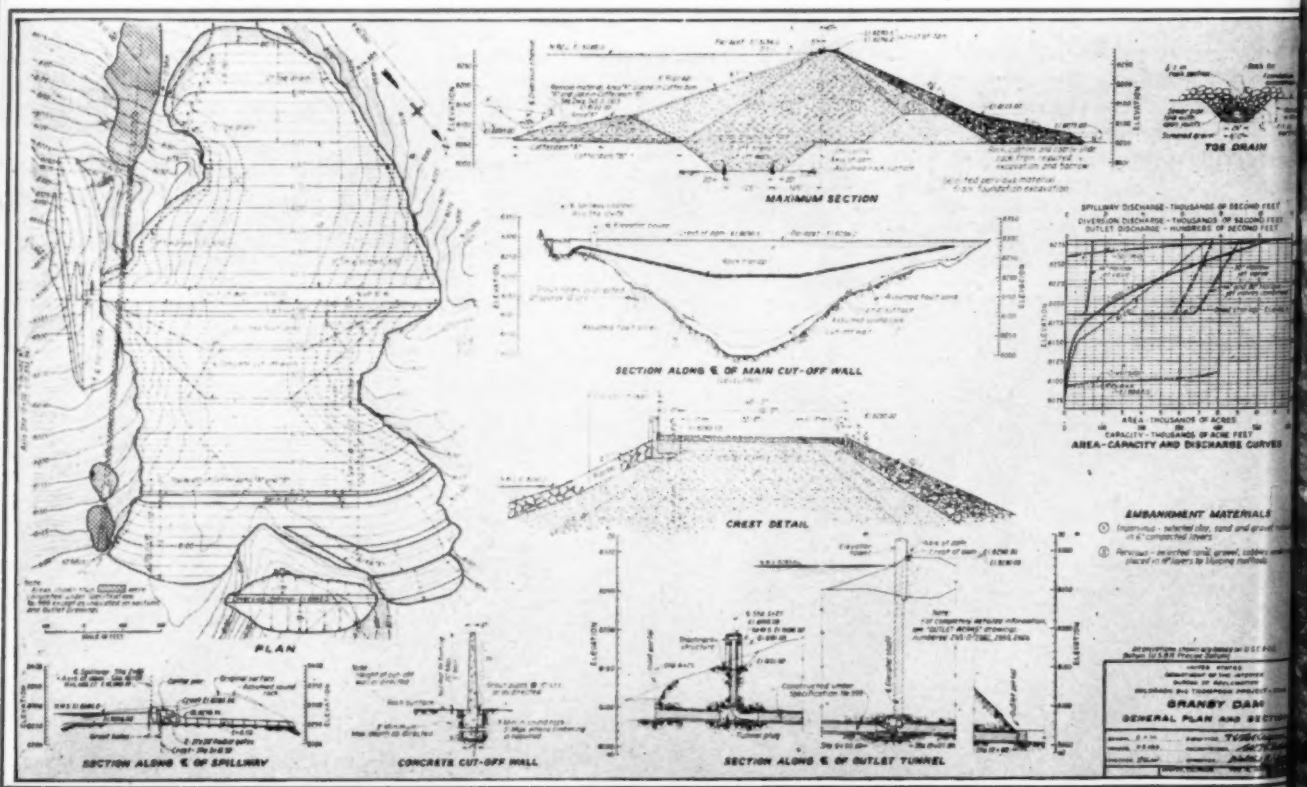
The channel leads to the left abutment of the dam where a tunnel of concrete 11′ 6″ in diameter and 1400 ft. long, previously constructed by Platt Rodgers Construction Company of Pueblo, Col., allows passage of the Colorado and completes the diversion of the river around the dam site. Excavation of the diversionary channel was accomplished in 50 days.

All new excavating equipment is being used on this project and may be listed as follows: One Bucyrus-Erie 54-B 2½-cu. yd. shovel, powered with Buda Diesel engine; two 1201 Lima 3½-cu. yd. shovels, powered with Cummins Diesels; one Bay City 55 1-cu. yd. dragline; two D7 Caterpillar tractors pulling 12-cu. yd. LeTourneau LP scrapers; six D8 Caterpillars with bulldozers; and two Caterpillar No. 12 Motor Patrol graders.

The Bucyrus-Erie 54-B and Lima 1201 shovels are being used for stripping 300,000 cu. yds. of topsoil from the borrow pits, for excavating for the dam foundation, and for removal of heavy vegetation. There will be 3,400,000 cu. yds. of common excavat- for the dam and Dike 3, and 120,000 cu. yds. of solid rock excavating. At the present time the distance, round trip, from the borrow pits to the cofferdam site is about one-half mile, and to the main dam site about one mile, on temporary roads.

The entire area to be occupied by the Granby Dam and Dike 3 will be excavated to a depth sufficient to remove all materials not suitable for the foundations of the dam and dike embankments. This waste material to be removed will include topsoil, rubbish, vegetable matter of every kind, and all other perishable or objectionable materials that might interfere with the proper bonding of the embankments with the foundation or the proper compacting of the materials. The foundation for the dam within the approximate area outlined on the diagram, below, will be excavated to rock. The area excavated to rock in the central portion of the dam will be unwatered and the slopes are to be maintained according to Government specifications. None of the excavating will be performed in standing water.

Exploratory investigation of the foundation for the dam is not sufficiently complete to disclose all seams, faults, and other defects that may exist at this time. The trenches for the drain under the downstream portion of dam embankment are being excavated in the foundation of the dam.



The borrow areas, three of them designated by the Reclamation Bureau, are located within one-and-one-half miles diameter of the dam proper. The Number 1 pit mainly provides impervious materials for cofferdam and main dam. Numbers 3-a and 3-b provide semi-pervious materials for outer portions of the dam. Rock riprap will be secured from the spillway excavation, and rocks separated from the foundation and borrow pit excavations. Two material separation plants having a capacity of 700 cu. yds. per hour, have been specially built by the F. W. McCoy Company of Denver.

The hauling equipment used on this project consists of: Four 15-cu. yd. FDT Euclid bottom dumps; four 15-cu. yd. Euclid end dumps; four 13-cu. yd. Euclid end dumps; ten White Motor Company trucks, with Winter Weiss bodies and Hercules hoists. (All trucks are powered with Cummins Diesel engines.)

The lengths of hauls now average about 1000 yards. The roads are temporary, but are good on the average, although the trucks hauling from the Bucyrus-Erie shovel are required to pass over the diversionary channel on a one-way bridge and are faced with a stiff climb in order to return to borrow pit Number 1 where this shovel is located. These six trucks, i.e., four 15-cu. yd. Euclid bottom dumps and two 15-cu. yd. Euclid end dumps haul over a 1000-yard round trip route. They are averaging four trips per hour

• White truck dumping rock at the foot of the permanent dam. Rock was loaded by the Bucyrus-Erie shovel at the left abutment.

• Above: Night shot of Texaco truck refueling Bucyrus-Erie shovel at borrow pit No. 1. Below: left and right abutments looking east up the Colorado River. In the foreground is the Bay City dragline at the right and the Lima shovel at the left. The coffer dam is in the center of the picture and the Bucyrus-Erie shovel is working on the hill to the left.

• Administration staff of Granby Constructors. Left to right are: Chat Oliver, project engineer; H. Walsh, paymaster; J. Elexson, accountant; J. Coley, assistant engineer; F. Richens, secretary, and R. Pruyne, office manager.

and approximately 65 yards per hour for each unit. This earth for the cofferdam is being hosed down at the shovel and has an average proctor density of 121 per cent. Two large sheepsfoot rollers, built by the F. W. McCoy Company of Denver to Government specifications, are being used for compaction at the dam, where the earth is also being watered by two White Motor trucks equipped with 3,000-gal. water tanks.

According to the progress schedule they are moving from the Lima 3½-cu. yd. shovel 2000 cu. yds. per eight-hour shift. This rock and earth from the dam foundation is moved to a waste embankment, a distance of one-half mile round trip, with four 15-cu. yd. Euclid end dumps, four 13-cu. yd. end dump trucks.

There has been very little drilling as yet, except on the larger boulders, where they are shooting about one-and-one-half pounds of 40 per cent gel per cu. yd. They have the following new equipment ready to use: One Chicago Pneumatic compressor,500 cu. ft.; one Sullivan compressor, 550 cu. ft.; one Ingersoll-Rand compressor, 210 cu. ft.; ten Gardener Denver jackhammers; and four Gardener Denver air tampers.

The hole spacing pattern will be determined at a later date, but depths will run from 30 to 160 feet. Only a small amount of explosives are kept on hand now. Later they will use Hercules, Du-Pont or Atlas 40 per cent gel. Shooting will be done twice a day during the noon hour and between shifts after all equipment is moved out of the area.

While no concrete work is being done at present, it is intended to use a central dry batching plant and transit mixers in moving material to location. The cement will be furnished by the Government, and the small amount used up to this time has been Penn-Dixie.

Unwatering will be accomplished by means of adequate sump pumps as soon as diversion of the river has been completed.

The Granby Constructors have set up camp at the dam site and are using 18 Quonset huts exclusively. Included in the camp are a 100-man mess hall, recreation hall, commissary and bachelor quarters. The married men have a separate area about two miles from camp, consisting of 31 single Quonset huts divided into apartments to accommodate 50 families with transportation furnished to and from work. Children are transported to and from school at Grand Lake by company bus. All school fees and tuition are paid by the Granby Constructors.

All labor used at the dam is obtained from the A. F. of L. un-

(Continued on page 46)

Evolution

THE CARTHAGENIANS INVENTED paved roads, but the Romans built most of the early day paved roads. Isidore, a Greek architect of the sixth century, says, "the Romans made roads almost over the known world." These roads were built into the most distant provinces of the Roman empire to facilitate the march of their soldiery and the transportation of supplies. The Romans paved their roads with a foundation of rough stones consolidated in a mass of mortar, which upon becoming solid, made a smooth and lasting surface.

Twenty-nine great military roads centered in Rome, which was divided into 11 regions, 113 provinces, and transversed by 372 great roads with a total length of 52,964 Roman miles.

The first of the great roads was the Appian Way, which was constructed by Appius Claudius Caecus in 331 B.C. The stones used to pave the Appian Way were hewn and closely fitted. Although more than 20 centuries have passed since its construction, it is still entire in many places.

During the African war a paved road was constructed through Spain and Gaul to the Alps.

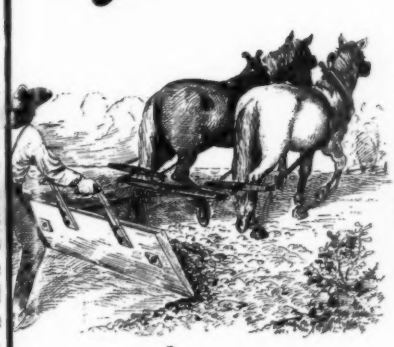
The Roman roads connected the capital with Savoy, Dauphine, Province of Germany and all parts of Spain, Gaul, Constantinople, Hungary, Macedonia and the mouth of the Danube on the other sides of the intervening waters. These roads also extended into Sicily, Corsica, Sardinia, England, Asia, and Africa.

The Roman roads were distinguished by the names Via, Actus, Iter, Semiter, Trames, Callais, etc. The Via was eight feet wide and was considered the best. The Via Militore, near Rome, was double width, or 16 Roman feet (ancient Roman foot, "pes" is 11.64 U.S. inches). The middle was paved and divided from the sidewalk by a curb two feet wide and 18 inches high. The middle was for the infantry and the margin for carriages and equestrians.

The Actus was four feet wide

(Continued on page 46)

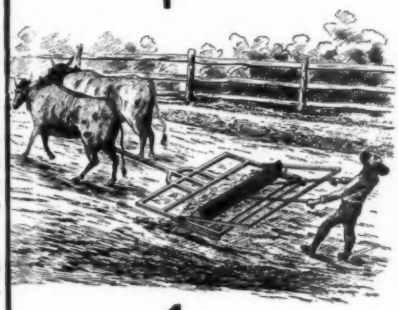
...ry of Road Making Machines



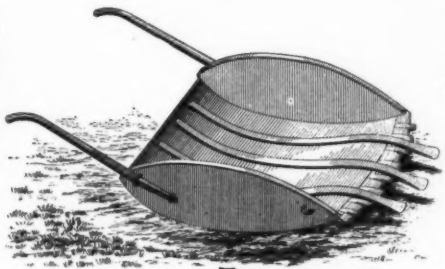
1

2

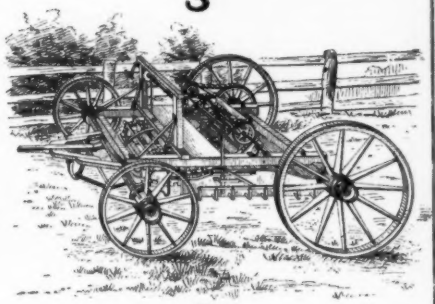
3



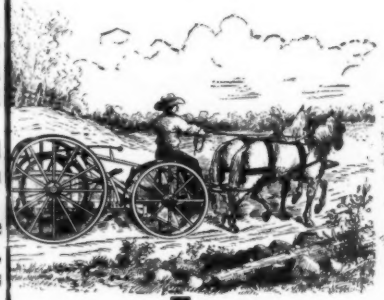
4



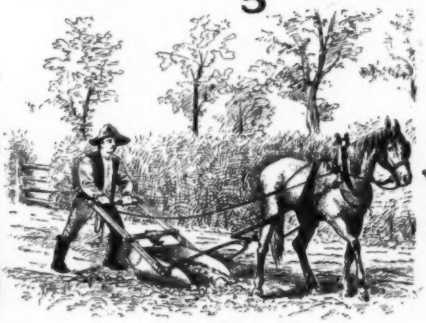
5



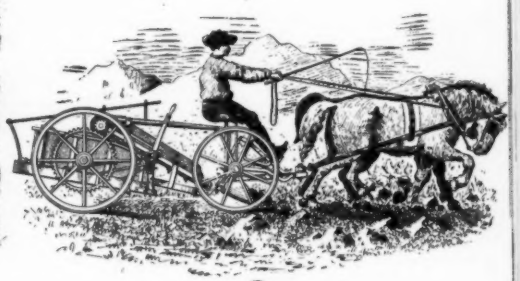
6



7

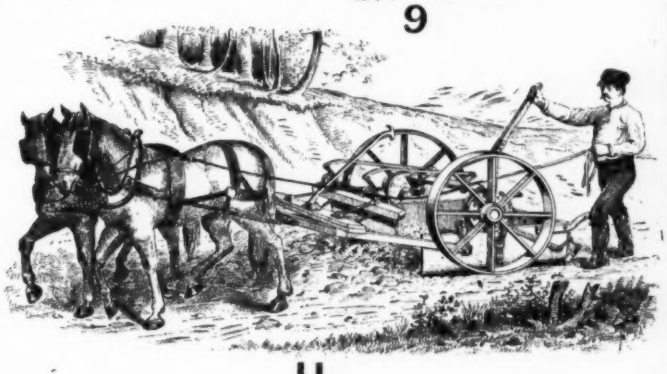


8



9

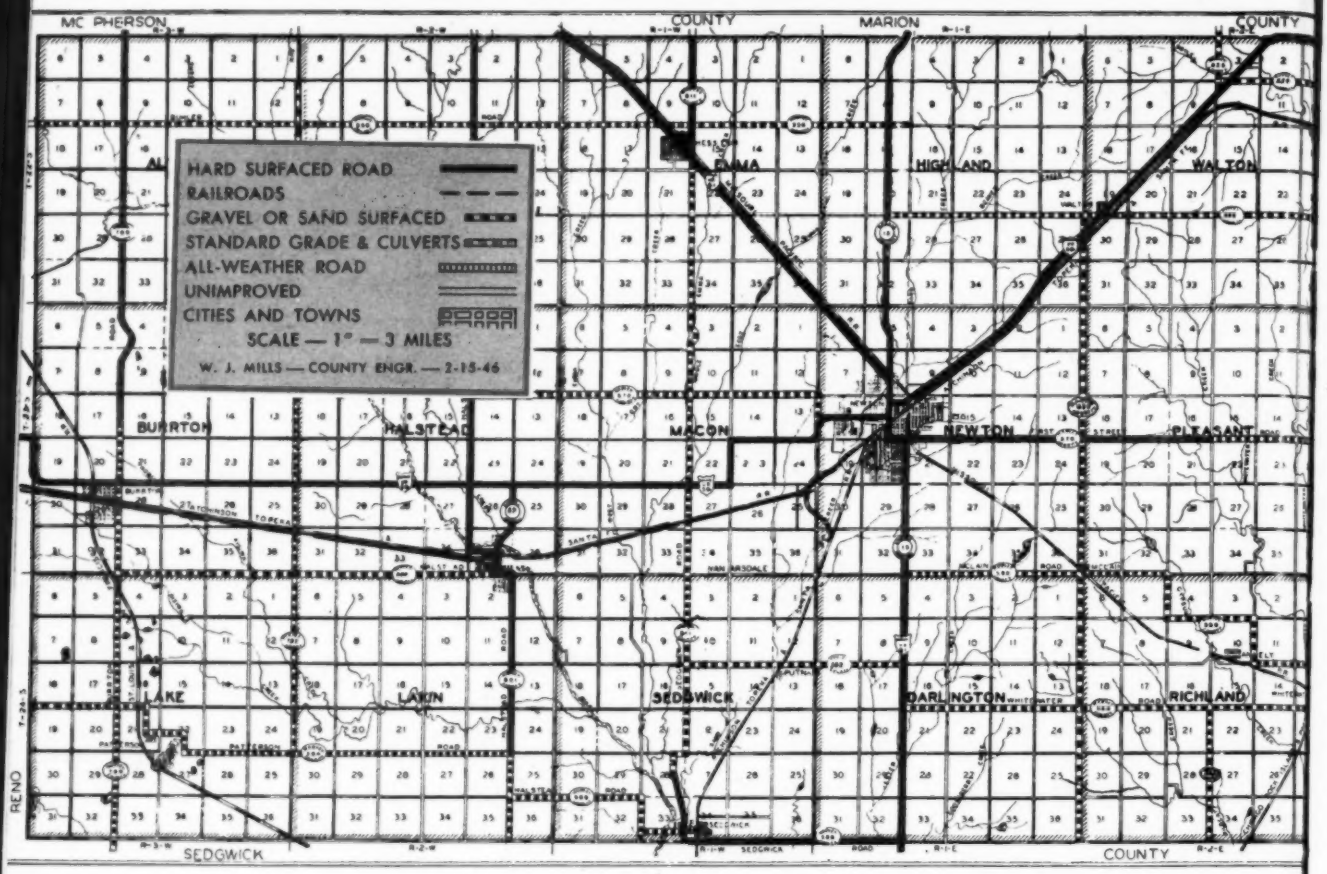
10



11

1. Primitive Leveller
2. Primitive Carrying Scraper
3. Sulky Scraper, U. S. Patent, 1831
4. Road Drag, U. S. Patent, 1839
5. Drag Scraper, U. S. Patent, 1850
6. Road Builder, U. S. Patent, 1883
7. Self-Loading Cart, U. S. Patent, 1867
8. Drag Scraper, U. S. Patent, 1879
9. Self-Loading Cart, U. S. Patent, 1881
10. Self-loading Cart, U. S. Patent, 1850
11. Wheel Scraper, U. S. Patent, 1884

From Warshaw Collection of Business Americana



Road Maintenance

in Harvey County, Kansas

Harvey County, Kansas, uses modern equipment to advantage in offsetting troubles caused by need of doing postwar work on a prewar budget.

LIKE MOST COUNTIES in the country today, Harvey County, Kansas, is faced with the problem of doing postwar work on a prewar budget. New construction restrictions, non-availability of materials, and restricted highway use enabled most counties, including Harvey, to operate on old budgets during the war years by confining their efforts solely to necessary maintenance. Probably the excellent job done in spite of wartime difficulties is one of the chief reasons for present insufficient budgets at a time when funds are sorely needed if counties are to catch up on their backlog of new construction and general improvements.

• A. C. Holdeman, left, looks over maintenance plans with W. J. (Jack) Mills, Harvey County engineer. Holdeman is in charge of all construction and maintenance of roads and bridges in the county.

Increased labor and material costs make the $85,000 annual Harvey County Engineer's department budget wholly inadequate for the postwar construction job facing it. It has been found that even when materials scarce for years are now available, there are not sufficient funds

to purchase them. Capital expenditures for equipment bring up another problem. For years little new equipment was available and so proportionately little of the budget was expended for this purpose. Equipment on hand was made to do in most cases and now much of this equipment needs replacement. In the case of Harvey County, for instance, new trucks are the dire need at the present time.

Although it is one of the smaller counties in Kansas, Harvey County has a total of 1100 miles of road in its 15 townships, of which 200 miles are in the county road system, 835 miles of township roads, and the remainder in state highways. Of the 200 miles of county road, 40 miles are black-topped and the remainder is of the sand and gravel all-weather type.

Bridge Replacements

In the county there are some 600 bridges. Many are now ready for replacement because they were built years ago of untreated timber and designed for five-ton loads. Replacements are constructed of concrete and steel, or treated timber, and designed for ten and 15-ton loadings. There are numerous crossroad culverts on the county road system, some of which are 40 feet long. Due to excessive rainfall in the past six years many culverts have been added. This expense, in itself, has been a drain on an already overloaded budget — one of the problems a county engineer faces.

Harvey County's engineer, W. J. (Jack) Mills is directly responsible to three commissioners elected from each of the three districts in the county. Assisting Mills is A. C. Holdeman, in charge of all outside work, including construction and maintenance of roads and bridges. Under Holdeman there are five patrolmen, one grading gang of four men, a bridge crew of from five to ten men, and two utility foremen responsible for crossroad culvert work, which includes laying and backfilling. Also assisting Mills is the shop foreman, C. W. Fry, who is in charge of all repair and maintenance of equipment. Working under Fry are two mechanics and one laborer. The repair shops include the necessary drill presses, welding equipment, and lathes, which are in use a great deal of the time in the repair of old pre-war equipment. The county engineer is in charge of the county shops located one and one-half miles northeast of Newton.

• Above. Walter four wheel drive truck with underbody blade prepares road for black-topping (below) with Kinney distributor on K 57 International truck in action.

County Shops

On the four-acre plot is the garage and storage building, 70 x 140 ft., a cement and hardware storage building, 50 x 50 ft., and numerous lumber racks and storage bins. Carefully laid out black-topped drives circle through this yard and between the many racks so that loading and unloading can be done efficiently.

The maintenance of roads, culverts and bridges for the construction of new roads and bridges and for many other operations under the county engineer's jurisdiction, the following equipment is used: five trucks, 1½ to 3-ton International and Chevrolet (each equipped with winch and A-frame); five one-half ton pickups including International, Ford and Chevrolet; one elevating grader; a Byers ¾-cu. yd. crane with 50-ft. boom; three concrete mixers, two Rex, a 10S and a 3S, and a 6S CMC; several pumps from 1½ to 6-inch size of various makes, a Bucyrus-Erie Dozer-Shovel equipped with a standard ¾-cu. yd. bucket mounted on an International TD-9 tractor; one Walters four wheel drive motor truck equipped with underbody

• Left: Clay for binder purposes on roads is dug and loaded to truck by Bucyrus-Erie Dozer-Shovel at borrow pit. The clay is dumped alongside the roadbed and mixed with commercial sand and gravel, also hauled to the road location, and dumped in windrows. Above: Hard-packed dry clay is dug without prior scarifying.

blade for road maintenance, and a Frink hydraulic snow plow with leveling wing.

Also included in the county's equipment are Caterpillar No. 112 and No. 12 motor graders, and Austin-Western 66 and Adams 301 motor patrols; a six-foot flat roller; a new sheepsfoot roller; one 12-ft. hand-operated Adams grader; a Galion 12-ft. hydraulic grader; two Model A International tractors with highway power mowers; one homemade mower; three tractors, a T-40 and a TD-18 International, and a Caterpillar RD-7; a LaPlant Choate C-47 scraper; two D-35 International TD motor trucks that pull eight-cu. yd. semi-trailers for gravel hauling, and one KS-7 International motor truck with 800-gal. Kinney distributor.

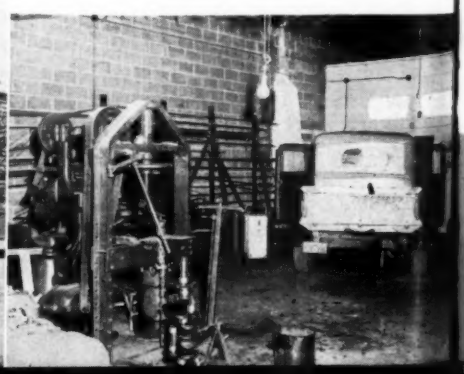
As the western one-third of the county is quite sandy, it is very necessary to add a clay binder to the soil in order to construct all-weather roads. Borrow pits are obtained as near to the construction site as possible and from these pits clay is taken and hauled to the road site. The Bucyrus-Erie Dozer-Shovel is most generally used in digging the clay from these pits and loading the clay into dump trucks. It has been found that one Dozer-Shovel can keep several dump trucks quite busy in this type of operation. The clay is then hauled to location and the proper quantities of sand are added. Then the materials are spread over the driving surface in three-inch layers, after which moisture is added and the layer is rolled until the desired compaction has been obtained. This is followed up by the addition of gravel for a wearing and driving surface. In several months a stabilized base has been secured, which after further stabilization with salt, will lend itself readily to a light type penetration and seal with asphalt.

For new road construction the Dozer-Shovel is used to clear brush and root around trees to be pulled out. It is also used to assist the graders and scrapers. This machine is used in ditches and deep depressions inaccessible to scrapers. It shovels dirt up to spots where scrapers can load handily.

Maintenance of crossroad culverts and laying new ones is a major part of the county engineering department's work. It has been found that the Dozer-Shovel is the most efficient machine for laying culverts, both corrugated metal and cement tile. With a three-man crew the Dozer-Shovel is used for the entire operation. It first makes the channel excavation with its bucket, throwing the dirt to the side of the ditch. Pipe hauled to location by truck is unloaded and placed in the previously excavated chan-

(Continued on page 45)

• Below: Harvey County shop and storage garage with oil house and gasoline pumps. Right: Motor repair department of shop.



Coal-handling Project

COAL FIGURES GREATLY in the far-reaching transportation business of The Chesapeake and Ohio Railway. Its current timetable states "Chesapeake and Ohio has great faith in the destiny of coal—is one of the largest users of coal —participates in all major coal research programs — extensively advertises the uses and importance of coal." Hence, it is especially interesting to note the sizable coal-handling project now being built near Huntington, West Virginia, to serve a central washing plant of the Truax-Traer Coal Company.

Flat areas bordering the railroad right-of-way are not so plentiful in the rough country that prevails in West Virginia, and so, to obtain space for new sidings, a major dirt-moving job was necessary. Three miles west of Huntington, at Ceredo, West Virginia, the railroad is on a high embankment bordering Twelvepole Creek which flows into the Ohio River a short distance away.

(Continued on page 45)

• Two Bucyrus-Erie four-wheel 8-10-yd. scrapers powered by International TD-18 TracTracTors and one Heil 6-yd. scraper pulled by International TD-14 get loads in borrow pit (above) and haul to embankment (below). Bucyrus-Erie Bullgrader above is cleaning up and those below are levelling.

Tractor equipment used by Smith Construction Company on earth moving job to improve C & O's facilities for handling coal mined from the West Virginia-Kentucky "Coal Bin of America."

"Aw, quit frettin Gus — when a guys time's up, his time's up and we can't prevent it."

"Well, haven't you ever seen a girls ankle before?"

"Ye Gawds, you were right, Clancy we are hooked onto the wrong one."

"Oh, here comes Yardley, now."

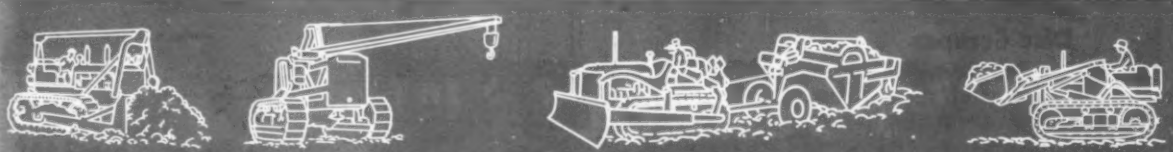
"Suppose Elmer meant it when he said he didn't like this new boss, and was gonna' quit?"

for Land Clearing

Roots out of the ground and pointed skyward. The International Diesel, under Mr. Kamp's experienced hand, rivals Paul Bunyan in stump removal. In two more minutes the stump's in the pile for burning.

INTERNATIONAL HARVESTER

Industrial Power

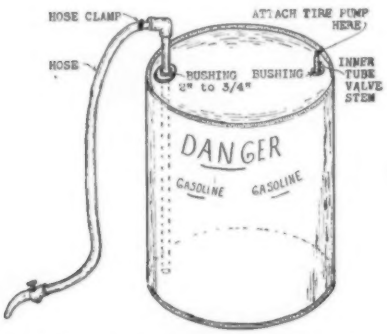


Field NOTES

Gasoline Pump

Here's a relatively simple handmade pump that can save you considerable time and gas that is wasted in the usual method of servicing equipment by drawing the gasoline into a bucket or can and then pouring it into the fuel tank through a funnel.

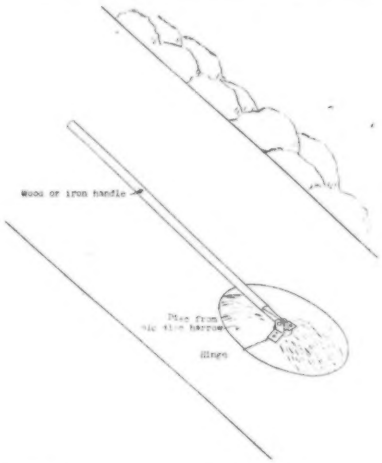
Secure an empty oil drum and replace the conventional filling plug of the drum with a two-inch bushing that has been reduced to ¾ inch. Next take a length of ¾-inch pipe cut so that the lower end will just clear the bottom of the drum when the top of the pipe protrudes through the bushing as shown in the diagram. Threads on the top end of the pipe must be run down about three inches so that it may be screwed into the bushing. A coupling is attached to the pipe after the end comes through the bushing. Now connect the nipples and hose as shown in the drawing.



Drill a hole in the outlet plug that is just large enough to take an auto or truck inner tube valve stem. Solder the stem to the plug. Now tighten both plugs and attach an auto pump to the valve stem. A few strokes on the pump will provide pressure inside the drum and gas will flow from the nozzle of the hose. If the threads of the plugs should leak out the air, use laundry soap on the threads. Keep all joints tight for good results with this pump.

Disc Scraper

A good way to reduce the problem of cleaning sand, mud, straw, snow and ice from highways, driveways, sidewalks, and basement floors is to make use of a handy disc scraper that can save you time and strength. The scraper is made by hinging a long



stiff handle of wood or pipe to a disc of an old disc harrow. The disc will shave the top of the concrete clean without damage to the expansion joints and the circular edge of the tool will sharpen itself as it slides over the concrete.

Rusty Pipe Cleaner

A very efficient tool for cleaning the inside of rusty pipes and boiler flues can be made from a reducing coupling and two pieces of pipe. First, secure a reducer coupling and a nipple that will fit inside the pipes or flues to be cleaned. Connect the two, and then, with a fine-toothed hacksaw, cut slots in the end of the nipple to a depth of two inches at about ¾-inch intervals.

Next, bend the segments outward far enough so that when all segments are bent, the tool will still fit inside the pipe or flue to be cleaned. After the segments are bent, file or grind the inside edge to provide a fine cutting edge for the tool. When this is finished, fit a length of pipe into the small end of the reducer to form the handle.

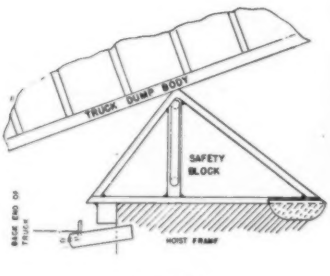
This cleaning tool will remove the rust from water pipes in a more efficient manner than other tools and do a quicker job on cleaning flues than most brushes now on the market. It is not advisable to use the tool constantly on boiler flues because of the wearing effect on the inside surface of the flue.

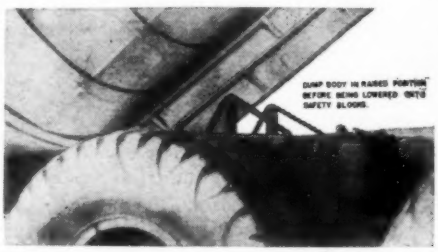
WM. P. HOUSER.

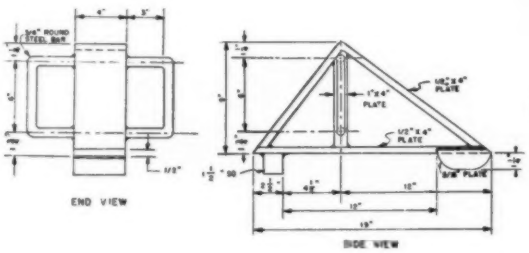
Safety Block for Dump Trucks

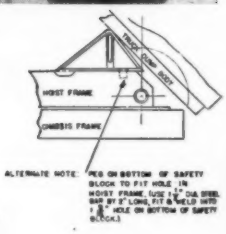
Many mechanics have been killed or seriously injured when raised dump bodies under which they were working fell. The Guy F. Atkinson Company of San Francisco, Calif., has developed a steel safety block which is placed on the hoist frame whenever mechanics work under the raised body. The block is made of welded steel bars in one unit. The construction details can be obtained from the National Safety Council.

Courtesy of National Safety Council









(Not to Scale)

Johnson
EXTRA TONNAGE at NO EXTRA COST

KOEHRING HEAVY DUTY

Milwaukee 10
Wisconsin

EASIER FILLING

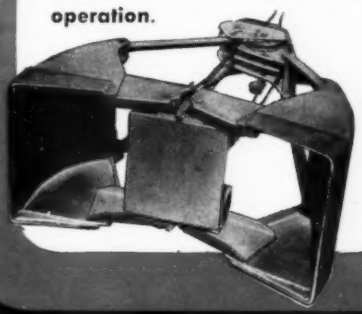
Smooth working surface and most efficient weight distribution for balance and greater digging efficiency. Stronger and longer-lived because of solid, heavy plate construction.

BIGGER LOADS

Wide, low-sided clams, with wide, solid lower arm brackets, get capacity loads and reduce spillage. Protector plate below lower sheaves keeps sheaves clean, prolongs life. Hard cutting manganese lip edge actually gets tougher with use.

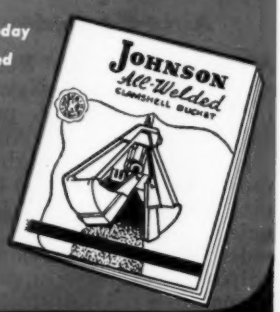
FASTER OPERATION

Larger diameter sheaves, with fully sealed needle roller bearings, reduce power loss by friction, deliver full power to cutting edge, combine to provide faster, smoother operation.



⅛ to 2½ yard sizes. General Purpose, Wide Rehandling and Heavy-duty Digging Type.

Write today illustrated catalog.



THE C. S. JOHNSON COMPANY

KOEHRING SUBSIDIARY CHAMPAIGN, ILLINOIS

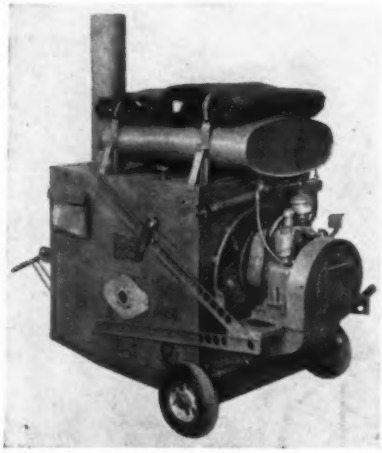
Equipment
you ought to KNOW ABOUT

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Portable Heater

Manufacturer: The Herman Nelson Corporation, Moline, Ill.

Claims: This gasoline-burning, portable heater weighs only 312



lbs. and can be transported from place to place by one man. It consists of an enclosed, gravity fed combustion chamber and finned, stainless steel heat exchanger within which the fuel is burned and the heat generated before being discharged through collapsible ducts which can be extended to the areas to be heated. Heat output is 190,000 to 250,000 btu per hour. Two 12-inch diameter, 24-ft. long, waterproof, flame and heat resistant ducts are standard equipment for the heater which may be used for pre-heating and thawing engines and machinery.

Airco Electrode

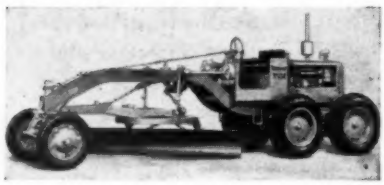
Manufacturer: Air Reduction Sales Co., New York, New York.

Claims: A general purpose, mild steel electrode, the Airco No. 87 operates on D-C straight or reverse polarity and on A-C, producing a weld metal of high mechanical properties. It is recommended by Airco for single or multiple pass welding on plates or sections where the fit-up is poor, or the work is rusty or dirty. The electrode conforms to A.W.S. Classification E-6012 and is marked in accordance with NEMA standards.

Motor Grader

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Powered by a rear-mounted, 35-brake horsepower, four-cylinder, four-cycle "Caterpillar" diesel engine, No. 212 Motor Grader is available in both tandem and single drives. It is normally equipped with 10-ft. moldboard and leaning front wheels and has the traction, strength and blade positions to do a complete range of blade work. Mechanical power controls operate all blades and scarifier movements.



Smallest of three sizes of Series "12" Motor Graders, the No. 212 is built primarily for those whose work requirements do not warrant purchase of the larger models.

FWD Model M10

Manufacturer: The Four Wheel Drive Auto Co., Clintonville, Wis.

Claims: The FWD Universal cab, streamlined radiator grill, and improved heavy duty axles are among the improvements of

design on the FWD Model M10 which the manufacturers have recently resumed producing. Originally placed in snow removal service by most highway departments, the new Model M10 will be marketed as a year-round performer in all types of highway construction and maintenance.

Engines with higher horsepower rating will be installed in the M10. The standard engine is a gasoline 186 B.H.P. engine with a customer's option on the installation of 200 B.H.P. diesel engine.

Apron Feeder

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis, Minn.

Claims: A portable apron feeder to be used in conveying heavy, sharp, abrasive rock and similar materials for which a belt conveyor is impractical. The long feeder, mounted on its own chassis and wheels, with hopper attached, can be swung into place quickly for short-time set-ups. Measuring 30-ft. from center to center of head and tail shafts, the feeder is supported on a single axle equipped with dual pneumatic tires. It's currently made in 36-inch width.

IN USE EVERYWHERE...

They've got to be good!

From one end of the world to the other, you'll find Gar Wood Hoists and Dump Bodies in action. The reason? They're designed, engineered, and built to do specific jobs, *no matter how tough.* Hydraulically operated, with simple controls... they dump *cleanly, quickly,* and *easily*... make it possible to get to the next job faster.

No matter what kind of material you work with... sand, gravel, rock, coal, or construction materials... there's a Gar Wood Hoist and Dump Body to make the job easier... help you make money, faster.

Gar Wood Hoists and Dump Bodies have been, and are constantly being proven all over the world on the toughest jobs. For *your* next job, specify Gar Wood.

ROAD MACHINERY
HEATING UNITS • MOTOR BOATS
WINCHES AND CRANES

GAR WOOD
GW
TRADE MARK
INDUSTRIES

Shots from the FIRING LINE

Many States to Consider Increased Gas Taxes

By BETHUNE JONES

Increased gasoline taxes for the support of postwar highway construction will be proposed in many of next year's state legislative sessions throughout the country, a survey of developments in state capitals reveals.

Despite the fact that record-breaking gasoline tax collections and delays in getting postwar highway construction under way leaves state highway funds in much better shape than had previously been anticipated, indications are that pressure for higher gasoline tax rates and other automotive tax increases will be strong in some states.

Gasoline taxes will be a particularly live issue during the forthcoming session of the Colorado legislature, in which a bill will be introduced for a two-cent increase to raise additional funds for highway construction. Opponents of such a move claim that current gasoline tax collections will provide ample funds to match federal aid, but State Highway Engineer Mark U. Watrous and Cady L. Daniels of Colorado Springs, chairman of the state Highway Advisory Board, contend the tax increase is needed to help finance a long-range road program to cost at least $15,000,000 a year.

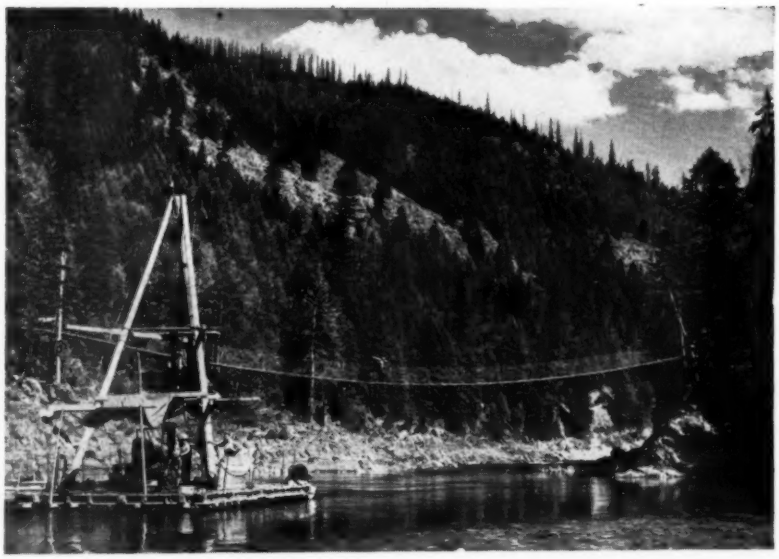
• **Overburden at Weirton Construction Co.'s Pennsylvania Mine is stripped with this Bucyrus-Monighan walking dragline with a 5 cu. yd. bucket on a 120-ft. boom.**

A two-cent-per-gallon gasoline tax rate increase also has been proposed in Utah, with the support of Gov. Herbert B. Maw. Here again, opponents argue that present gasoline tax revenues are sufficient to match federal-aid allotments. Various groups, including the Utah Motor Transportation Association and the Utah Highway Advisory Council, also have gone on record as strongly opposed to consideration of a gasoline tax increase until steps are taken to prohibit the diversion of automotive tax receipts to unrelated purposes.

Proposals for a substantial increase in gasoline taxes are expected to become a live issue during the 1947 session of the California legislature, along with recommendations for a huge program of highway construction expansion. Looking further ahead than most states in its highway planning, California recently received a recommendation, based upon an engineering study, that it should spend $2,246,000,000 on highways during the 1950-60 decade. This and other far-reaching construction proposals will be cited during the coming legislative session as necessitating new taxes.

In recognition of prospective proposals for a gasoline tax increase in Minnesota, the Minnesota Automobile Association recently went on record as opposed to any such action.

Possibility of a one-cent-per-gallon gasoline tax has been discussed in Montana as a means of raising funds to complete the highway program outlined by the Montana Highway Commission. Various other new levies, including a ton-mile tax on commercial vehicles,



• **Bureau of Reclamation diamond drillers at work on the South Fork of Flathead River in northwestern Montana are probing the bedrock of the site for the proposed Hungry Horse Dam.**
Bureau of Reclamation Photo

also may be proposed during that state's 1947 legislative session.

Chairman Robert M. Reindollar of the Maryland State Roads Commission has proposed a one-cent increase in Maryland's gasoline tax rate to provide additional highway construction revenue. Terming Maryland's present primary highways "outmoded and inadequate," he told the State Legislative Council earlier this year that additional funds would be necessary for their rehabilitation.

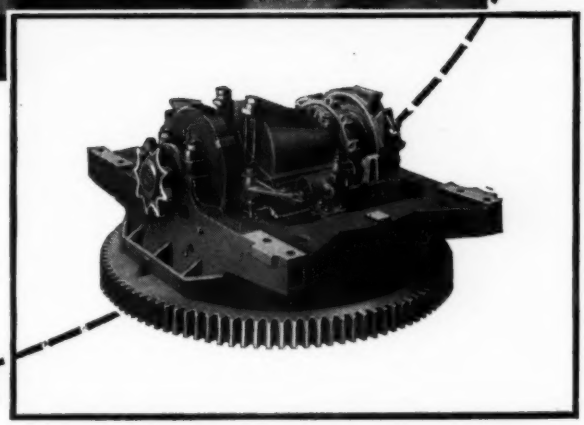
Higher gasoline taxes are again expected to be sought in Connecticut, where both Gov. Raymond E. Baldwin and the State Highway Commission unsuccessfully proposed a one-cent increase during the 1945 legislative session.

Another state in which increased gasoline taxes may be proposed during 1947 legislative sessions is Arkansas, where a ½-cent increase has been proposed, along with other new or added automotive levies.

While gasoline tax increase proposals generally will be keyed to highway construction plans, such bills may appear in some states for general purposes. For example, a one-cent gasoline tax rate increase was recently suggested in New Jersey as a means of providing from $8,500,000 to $9,000,000 toward the financing of a soldier bonus program. The proposal was quick to draw opposition from highway-user organizations.

During the comparatively few regu-

Steer Without Stopping



with OSGOOD Air Control

Smooth, effortless steering—without stopping the forward motion of the machine—with the cab in any position—that's OSGOOD Air-Controlled Steering! Independent air cylinders, actuated by a small lever in the cab, disengage and set steering brakes on the driving sprockets instantly, eliminating the need to hunt for a point where a steering lock can be engaged.

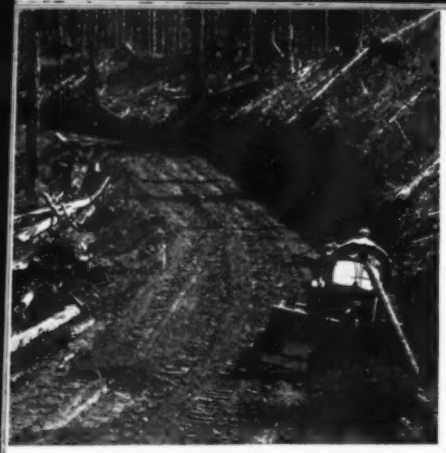
OSGOOD Air Control means faster, safer operation . . . more work done in less time, with less effort. Plan now to choose an OSGOOD. A complete line of power shovels, draglines, cranes, clamshells, backhoes and pile drivers . . . a model for every type of work.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO.
EXCAVATOR

MARION OHIO

DIESEL, GASOLINE OR ELECTRIC POWERED • ⅜ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES



• Building logging truck road with Allis-Chalmers HD-10 tractor and Baker bulldozer.

lar state legislative sessions convened during the current year, a one-cent gasoline tax increase was enacted in Virginia while similar proposals were rejected in a number of other states, including Massachusetts, Rhode Island, Kentucky and Mississippi.

The Virginia tax increase, opposed by gasoline retailers but supported by the Virginia Highway Users' Association, was enacted as part of a program which included repeal of the state's two per cent gross receipts tax on motor trucks; a 25 per cent reduction in passenger car license costs and an increase in truck license fees. The Virginia Oil Men's Association already has begun a campaign for repeal of the additional gas tax levy, although the Virginia legislature is not scheduled to convene in regular session again until 1948.

Movements for reduced gasoline tax rates are planned for next year's legislative sessions in several states, including Oklahoma, Florida and South Dakota. Prospects for the success of such campaigns appear brightest in Oklahoma, where an interim state legislative tax study committee has advocated abolition of a two-cent increase enacted in 1945.

Besides Oklahoma, three other states — Idaho, Iowa and Kansas — enacted gasoline tax increases during their 1945 legislative sessions.

Figuring prominently in the gasoline tax issue during next year's legislative sessions will be pressure by municipalities for a greater share in state-collected revenues. Some 30 states already share state gasoline taxes and motor vehicle license fees and municipalities in many states are planning to seek a larger slice of such revenues.

An Indiana bill will ask return of one-third of state gasoline and license revenues to city and town governments for street construction and maintenance. A Tennessee measure will seek allocation of a 1-cent share of the state gasoline tax to municipalities. Oregon cities want 15 per cent of state gasoline tax collections, while Oregon counties will propose legislation granting them authority to impose their own local gasoline taxes.

Columbia Basin Construction Program to be Expanded

The construction program on the Bureau of Reclamation's million-acre Columbia Basin Irrigation Project in Eastern Washington will be expanded as a result of President Truman's relaxation of restrictions on expenditures by the agency, the Bureau announced.

Approximately $25,000,000 in dams, canals, siphons, and heavy machinery are in the Bureau's "pending" files, and awards of contracts covering these items will be made "as rapidly as feasible and within the limits of the Bureau to meet progress payments as authorized work proceeds," commented District Engineer Frank A. Banks. Work on some irrigation structures in the Basin began last summer.

The construction moratorium did not affect work on several key structures in the multi-million-dollar irrigation system, such as the 10,000-foot South Dam, the gigantic Bacon Tunnel, a portion of the West Canal, the river-size Main Canal, and the Pasco Pumping Plant and distribution system.

Contractors in the Basin have more than 600 men employed on a 90-mile front extending from Coulee City, at the north, to the vicinity of Pasco, near the southerly tip of the Basin. These contractors predict that payrolls will be doubled by next summer. This estimate of 1,200 workers does not include employees who would be hired under

Welded Construction

MAKES A BIG DIFFERENCE...

WELLMAN

Williams Type BUCKETS

• Wellman leads the field in welded bucket construction. Wellman improved design means *better service, lower cost for you!* A type for every purpose: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service; ⅜ to 16½-yd. capacity.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY

7022 CENTRAL AVENUE • CLEVELAND 4, OHIO

What 63 Years of Dredge Building Means to You

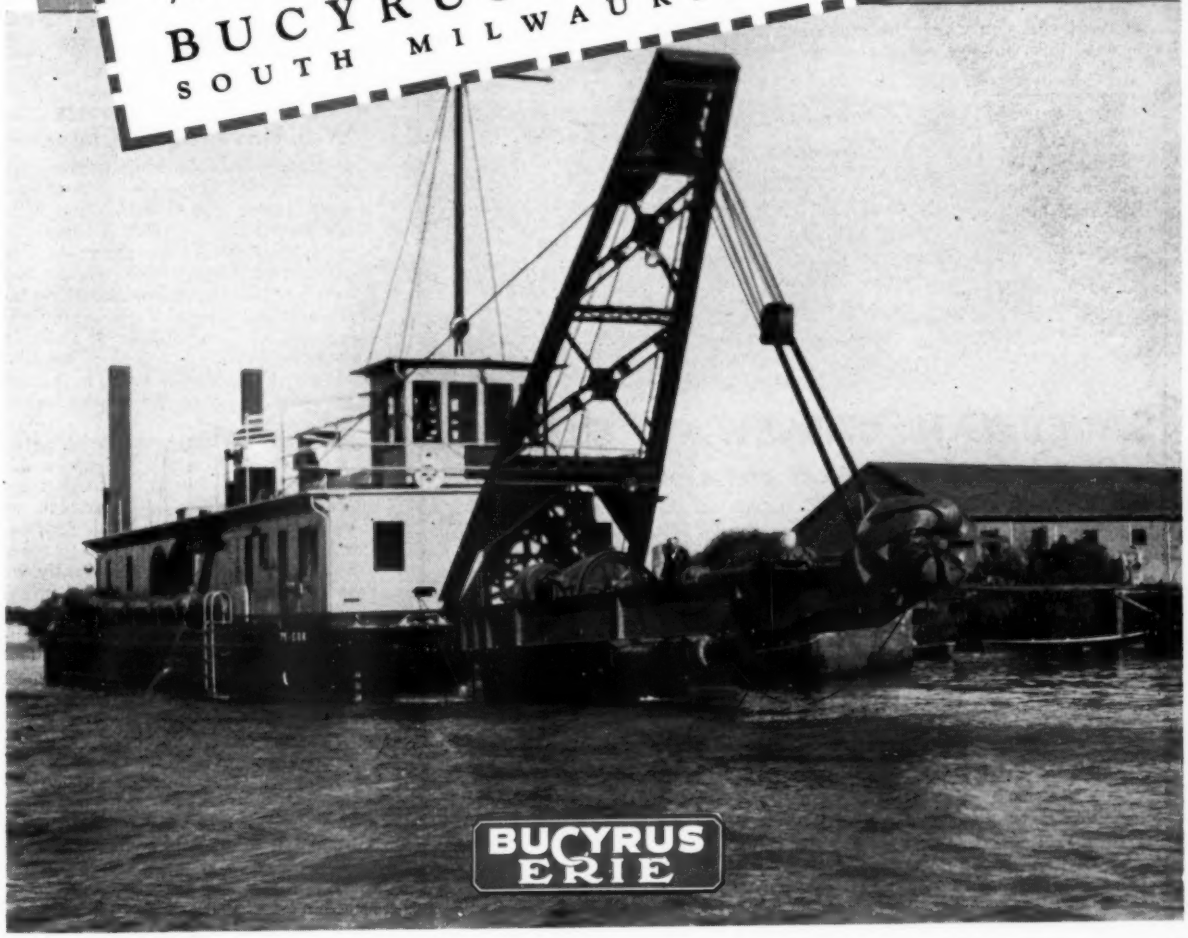
The wealth of experience gained in designing and building dredges since 1883 qualifies Bucyrus-Erie to build the best machine for **your** job — one which will give the highest overall efficiency under **your** particular operating conditions.

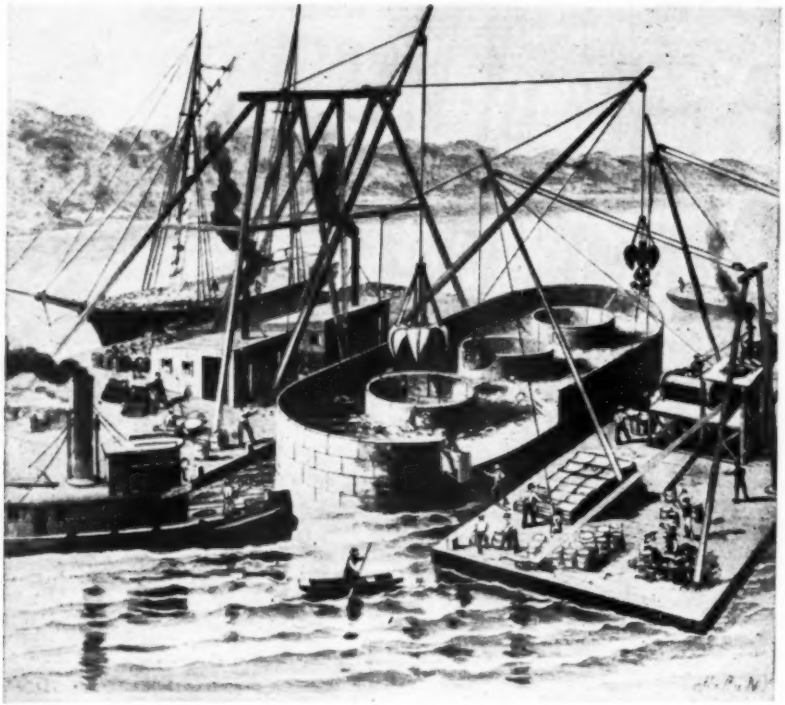
Thoroughly experienced Bucyrus-Erie engineers study in detail every aspect of your job, and they design a dredge to best satisfy operating requirements. Skilled personnel, working with unequalled facilities, then build your dredge to highest manufacturing standards.

At every step, through design, manufacture and erection, you benefit from Bucyrus-Erie experience. This is your assurance of getting the machine that will give you the biggest output—the best operating economy possible to obtain.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

18D46C





• Excavating work preceding the building of a pier for the Hawkesbury River Bridge, New South Wales, Australia, in 1886. The Union Bridge Co. of New York was awarded the contract for the foundations of this double track steel railway bridge across the Hawkesbury River, 30 miles north of Sidney. The river bed was made up of mud and sand to a depth of 185 ft. below high water. The rails are 42 ft. above high water and so the total height from the bottom of the piers to the rails is 227 ft. Pier foundations were dug inside coffer dams with an orange peel type bucket.

Photo from The Bettmann Archive

contracts yet to be granted by the Bureau.

Among the jobs on which the Bureau has opened bids, but has not announced contracts, are: (figures represent low bids)

Potholes Dam, $9,359,011; Long Lake Dam, $1,770,592; aggregates at Adrian, Wash., for concrete structures, $373,-612; portion of the East Low Canal, $3,977,136; six 65,000-horsepower electric motors for the Grand Coulee Dam Pumping Plant to serve the irrigation system, $2,475,548; discharge pipes for Pumping Plant, $1,271,854; and three turbines and generators for the now-vacant East Powerhouse, $5,581,-517.

Construction and equipment contracts approved by Reclamation Commissioner Michael W. Straus for the Columbia Basin Project since V-J Day have totaled more than $20,000,000, of which more than $13,000,000 were for siphons, canals, pumping plants, the South Dam, near Coulee City, and other structures in the vast water-distribution system in the Big Bend region of the Columbia River.

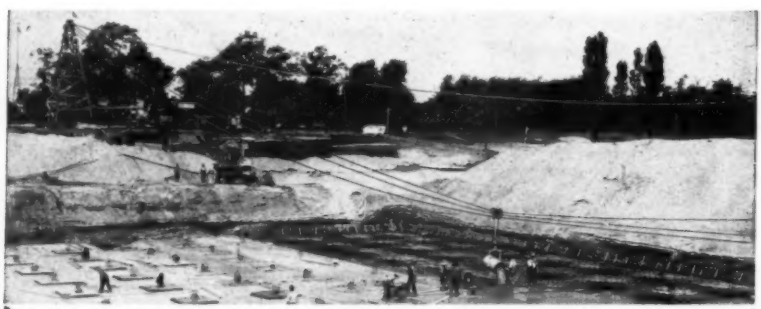
Small Town Airports Will Have Their Chance

America's smaller communities will have as good a break as metropolitan centers under the Civil Aeronautics Administration's postwar Federal-aid airport development program, Walter R. Macatee, manager of the airport division of the American Road Builders' Association, pointed out in addressing a group of air officials. It is likely that more than 50 per cent of the airfields under consideration will be located in cities of less than 25,000 population, he said.

Requests arriving in Washington from cities of all sizes indicate a deluge of applications. He defined a request as an informal expression of interest—a "feeler"; while an application is a formal, detailed petition for a grant of Federal funds. "Naturally we have not yet reached the application stage," he said.

"The Federal-aid Airport Act authorizes a half billion dollars on a 50-50 matching basis for the construction phase of Class III and smaller airports to be expended over a period of seven years," the airport division manager continued.

"Costs will vary just as cities vary in size. Airports in cities of less than 25,000 can in some cases be built for $40,000 or less, while big city air terminals will run into millions. Since the small ones cost less, there is a scaling down of Federal participation in



SAUERMAN CABLEWAY SYSTEMS

Long Range Excavators and Aerial Conveyors

When you need a machine that will dig or lift materials and haul these materials a considerable distance in one operation, you will find that SAUERMAN equipment fills the bill. Above is a light SAUERMAN Tautline Cableway pouring concrete for reservoir. It also made the excavation, being first rigged as a SAUERMAN Slackline Cableway, then converted into tautline conveyor. On thousands of jobs all over the world SAUERMAN Machines are making tough jobs easy, cutting costs wherever installed. One operator does the job! Speedy and powerful in every operation, with amazingly low operating costs, and long adaptable range. Simple, versatile, dependable. Write for catalog and look over the evidence of what these machines are doing on large and small construction jobs.

SAUERMAN BROS., INC.

574 S. Clinton St., Chicago 7

SAUERMAN

Long Range Material Handling Machines

no other DRAGLINE BUCKET ..... gives you this combination of advantages!

LESS POWER TO PULL

EASIER CONTROL

EASIER SPOTTING

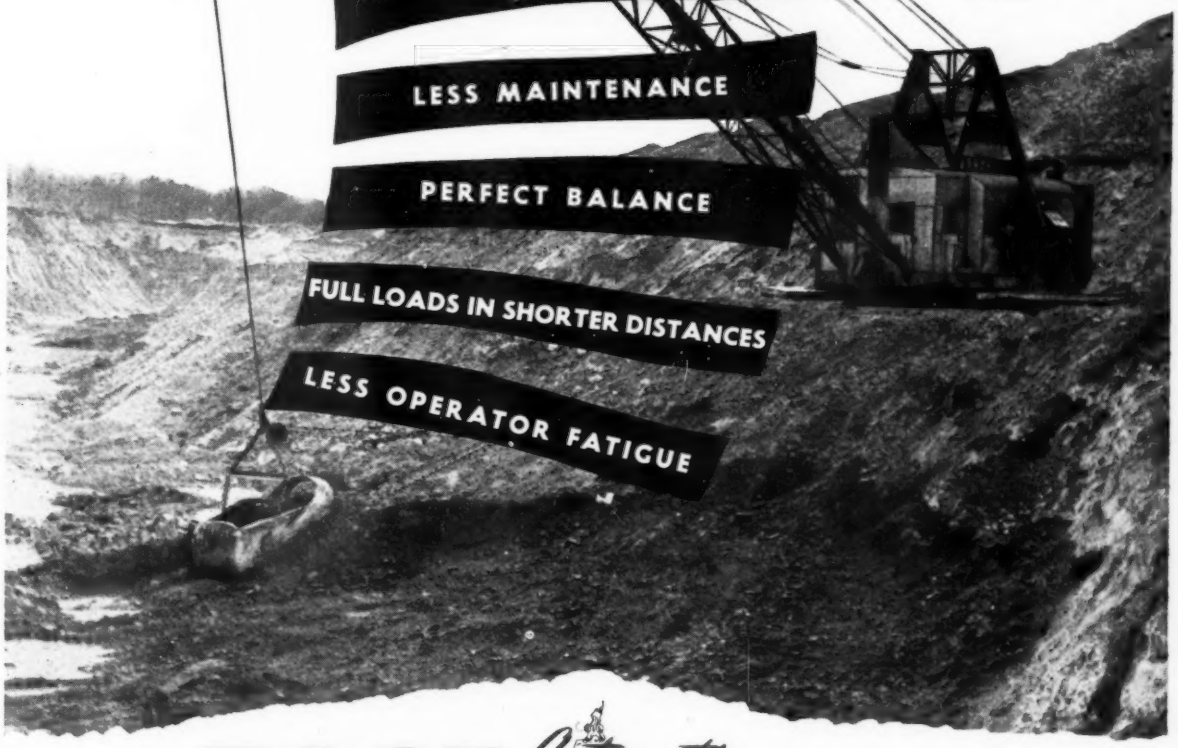
LESS MAINTENANCE

PERFECT BALANCE

FULL LOADS IN SHORTER DISTANCES

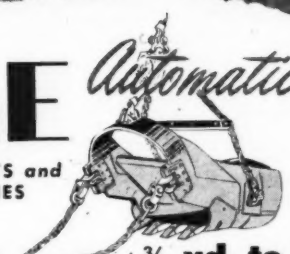
LESS OPERATOR FATIGUE

New Page Reversible Center Shank Tooth Points These new Page Manganese tooth points will stay absolutely tight on the lip because the new hook bolt fastening prevents wearing and tearing of the bolt and also allows quick and easy replacement.



PAGE *Automatic*

DRAGLINE BUCKETS and WALKING DRAGLINES



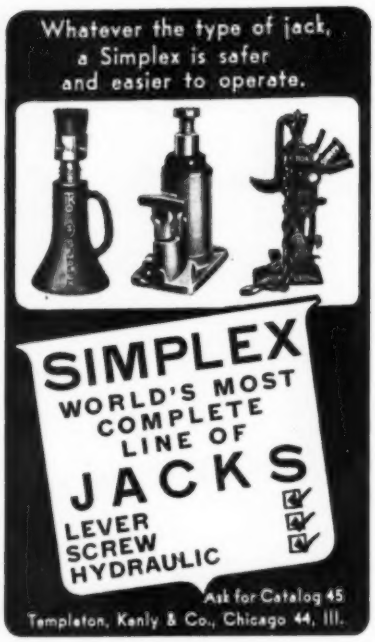
PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

a size for every job ..... ⅜ yd. to 35 cu. yd. and larger

• Bucyrus-Erie 1½-cu. yd. shovel loading stone into a 15-ton rear dump Euclid during construction of the diversion tunnel outlet at Sanalona Dam in Sinaloa, Mexico, being constructed by the Comision Nacional de Irrigacion in Mexico. The dam is located on the Tamazula River near Culiacan and when completed will contain about 5,000,000 cu. yds. of earthfill. The dam will be 2600 ft. long and will rise 220 ft. above the river bed. Morrison-Knudsen de Mexico, S.A. has a contract for 3¼ million cu. yds. which must be completed this year. This company is using 37 Euclids on the job and and the Comision has six rear dump Euclids on the project.

considering the larger projects. Projects in certain western states have a slightly larger Federal participation due to large areas of non-taxable lands in these states.

"The CAA at this time wants to know what cities are interested. Municipal air-mindedness does not depend on size. If a community really wants an airport, action at this time is indicated. Eight definite steps are required to complete full arrangements leading up to the actual granting of Federal-aid. Federal-aid funds are apportioned to the states on the basis of their relative population and area."



Recommend California Spend $2,246,000,000 for Roads

A recommendation that California should spend $2,246,000,000 on highways during the 1950-60 decade in order to keep pace with its expanding population and motor vehicle traffic was contained in a 144-page engineering study submitted to the state joint legislative fact finding committee on highways, streets and bridges.

Present tax sources would fall about $750,000,000 short of such a goal, it was indicated by the report, but a tax study to be submitted later to the committee was expected to suggest ways and means of obtaining the revenue.

The engineering study was prepared by G. Donald Kennedy of Washington, D. C., consultant for the interim legislative committee, which is headed by State Senator Randolph Collier of Siskiyou County.

Construction of a network of expressways throughout the state totaling 2,940 miles was envisioned by Kennedy. These would connect the major centers of population and would be supplemented by a state trunk line system totaling 8,545 miles.

"The expressways," the study report said, "would consist of an integrated network of modern, high speed, limited access routes connecting the major centers of population, with extensions into the cities."

Kennedy's proposed 10-year expenditure would be divided as follows: State highway system, $1,187,000,000; county roads, $523,000,000; city streets, $536,000,000.

Asserting that the California highway system was deficient when World War II started, the report pointed out that progress could not be made during the war with the result that facilities now are inadequate to meet the demands of constantly increasing traffic.

The study found that travel on California highways this year is at an all-time high level of 32,000,000,000 vehicle miles per year, 20 per cent above 1941, the previous record year.

A population of 11,100,000 in California by 1960 and 14,700,000 by 1980 is forecast by the report.

Use Scrapers in Refacing Job at Kingsley Dam

Kingsley Dam, north of Ogallala, Nebraska, is currently being refaced on the upstream side with a three-foot layer of quarried lime-stone riprap. Beneath this is being placed a filter face of ¼" to 2½" gravel to prevent the washing away of dam material. The new facing will replace the precast concrete riprap installed in 1941, which failed when unforseen wave-action caused it to collapse. The huge dam forms Lake McConaughy—one of the main reservoirs of the Central Nebraska Public Power and Irrigation District.

Tobin Quarries of Kansas City, who are handling the resurfacing work, are importing 35 cars of limestone per day from Wyoming for the riprap. Gravel for the filter face is hauled in from a nearby 200-ton-per-hour screening plant, used to separate usable gravel from rough, pit-run mixture. This rough material is obtained from Tobin's two-mile pit area that consists of small hills of sand, clay and gravel. However, gravel formations there are spotty, running from 2 to 10 feet deep, and carry a large percentage of sand.

To salvage this needed gravel, Tobin Quarries are using three Tournapulls to strip the knolls of earth and sod. The big rigs then load the gravel mixture and haul it to the screening plant grizzly, where it is dumped onto a conveyor. The resulting screened gravel is

"Harcote 20" Rockwell C Hardness 15-25
"Harcote 35" Rockwell C Hardness 30-40
"Harcote 45" Rockwell C Hardness 40-50
"Harcote 55" Rockwell C Hardness 50-60

NOW! P&H Hard-Facing Electrodes To Match Desired Rockwell "C" Hardness

P&H now makes hard surfacing a simpler, easier job — *easier* in the selection of the correct electrode . . . *easier* to get the desired as-welded hardness.

These four new P&H "Harcote" Electrodes do it! For now Harcote is available in a type having the exact degree of Rockwell C hardness for the job. If the job calls for a Rockwell C hardness of 55 — just order and use Harcote "55". That's all there is to it! No guesswork — no confusion. Simply specify "Harcote" according to the corresponding number of Rockwell "C" hardness desired.

SAVE TIME — SAVE EQUIPMENT — USE P&H HARCOTE

P&H

Call Your P&H Representative or write for complete information on Harcote. A complete line of other P&H electrodes is also available.

HARNISCHFEGER CORPORATION

General Offices:
4517 W. National Ave., Milwaukee 14, Wis.

bin-loaded into trucks that haul it to the dam face for spreading.

Meanwhile, the scrapers, after dumping their loads, pull around under the hopper, and are loaded with waste sand, which is hauled back to the mined-out areas and dumped. Haul distance for the high-speed units range up to 4,000 feet, over haul roads that are kept as level as the terrain will permit. Difficult working conditions are further intensified by high winds and dust.

Postwar Road Construction is Started in Vermont

The commissioner of highways announced that since the end of the war a total of 21 miles of highways and 19 bridges have been placed under contract in Vermont under the supervision of the State Highway Department.

According to the department's records, this work represents a total estimated cost of $2,358,153.98, of which approximately $1,203,658.62 will be paid by the federal government and $1,154,495.36 by the state.

In addition to contract projects, the Highway Department now has 69 miles of road under construction with its own forces, totalling an estimated $577,763.36. Much of this work consists of widening narrow sections to facilitate snow removal and the maintenance of two-way winter traffic.

Special construction assistance to towns in surfacing their state-aid highways is being given by the department to the extent of 80 projects totalling approximately 75 miles of improvement. In each case a paved surface is involved. Aside from these, the towns have resumed construction on a considerable mileage of their town and state-aid highways with the state funds allotted to them for this purpose.

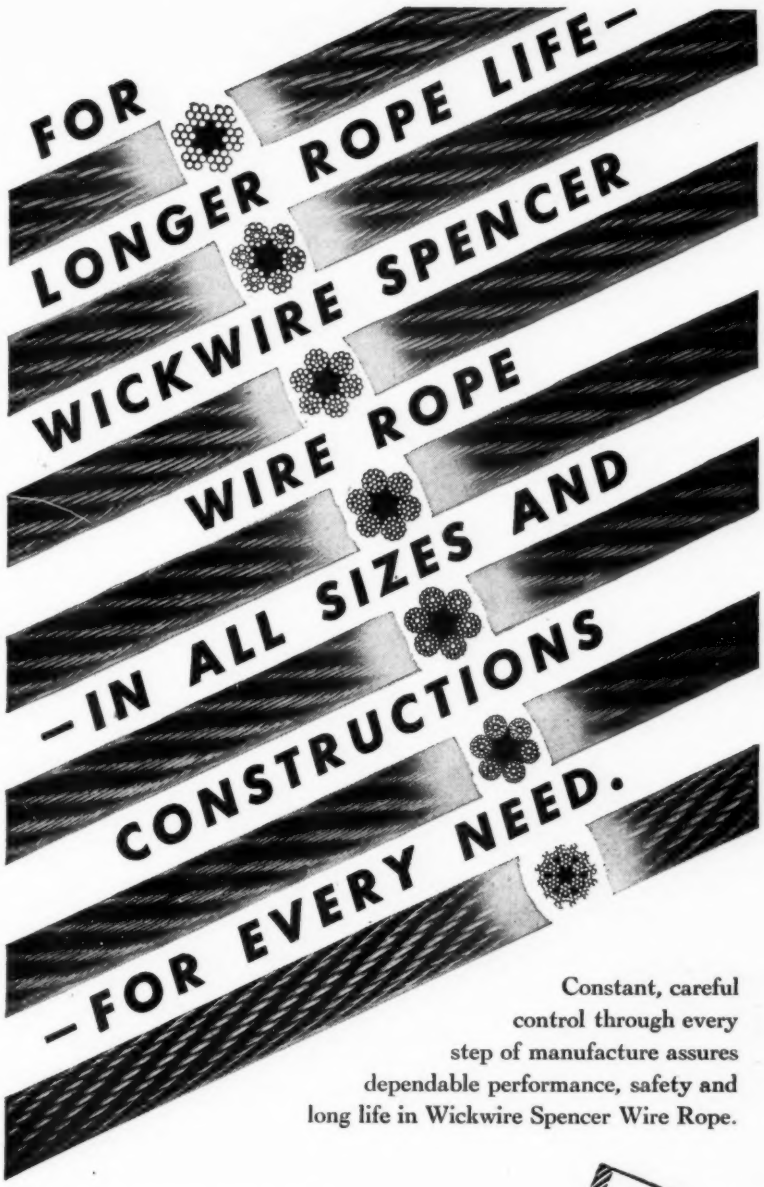
Commenting on highway construction generally, the commissoner said that in many respects materials have been harder to obtain this year than during the war. There is a critical lumber scarcity, and the strikes last spring still are being felt in the delayed deliveries of repair parts and equipment. He pointed out that in many sections the end of the war has not relieved labor shortages.

Seek 1,000-Mile Network of Ohio Superhighways

Enactment of enabling legislation will be sought during the 1947 session of the Ohio Legislature for a 1,000-mile network of five toll-financed superhighways costing an estimated $650,000,000.

The plan was conceived by the Ohio Turnpike Committee, which recently opened offices in Cleveland. A committee of approximately 200 members, headed by Dr. William P. Edmunds of Youngstown and Cleveland and including manufacturers, road contractors and labor representatives, was appointed at a subsequent meeting in Columbus to prepare plans for carrying out the program within the next three years.

Included in the program would be five



Constant, careful control through every step of manufacture assures dependable performance, safety and long life in Wickwire Spencer Wire Rope.

HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

For your FREE copy, write
Wire Rope Sales Office, Palmer, Mass.

WICKWIRE SPENCER STEEL DIVISION
The Colorado Fuel and Iron Corporation
THE CALIFORNIA WIRE CLOTH CORPORATION

EASTERN GENERAL SALES OFFICE
361 DELAWARE AVE., BUFFALO 2, N. Y.

EXECUTIVE OFFICES
DENVER 2, COLORADO

WEST COAST OFFICES
OAKLAND 4, CALIFORNIA

routes, similar to the famed Pennsylvania Turnpike, as follows:

1. From the Pennsylvania Turnpike in the east, extending to the Indiana state line, south to Youngstown, between Akron and Cleveland, between Lorain and Elyria, south to Sandusky and Toledo. Distance 237 miles, cost approximately $160,000,000.

2. From the Pennsylvania Turnpike to the Indiana state line, running south of Columbus, between Springfield and Dayton, a spur to Cincinnati, then to Indianapolis. Distance 240 miles, cost about $160,000,000.

3. A superhighway following roughly Route 3 from Cleveland through the Columbus area and to Cincinnati. Distance 240 miles, cost about $160,000,000.

4. From Erie, Pa., to the Cleveland area, connecting with the New York State Turnpike. Distance about 80 miles, cost about $50,000,000.

5. South from Toledo and passing near Findlay, Lima, Springfield and Dayton to Cincinnati. Distance 200 miles, cost about $130,000,000.

Approximately 75,000 workers would be employed on the projects, according to the committee's estimates. During construction, and until the highways are paid for by the toll charges, the roads would be controlled by a state commission to be appointed by the governor. When the toll money retired revenue bonds for the highways, the roads would become the property of the state, it was explained.

Main speaker at the recent meeting in Columbus was Joseph K. Knoerle of the J. E. Greiner Co., Baltimore, Md., consulting engineers on the Pennsylvania Turnpike.

"Ohio," he declared, "needs approximately 1,000 miles of superhighways to provide for the ever increasing motor freight traffic and to relieve congestion on its existing highways."

State Senator Ralph Winters of Lodi, another speaker, emphasized that the projects would be financed by tolls and that the "committee is not asking for tax money."

Predict Record Income from Auto Taxes in 1947-48

Predicting that the states during the next few years will derive substantially more from automotive taxes than in the peak prewar year of 1941, the American Petroleum Industries Committee asserts that this outlook, together with the greatly expanded federal-aid highway program, "gives assurance that there will be ample funds for needed road development and improvement within the framework of present taxes."

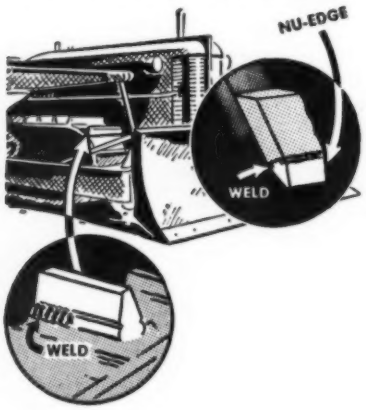
Public Roads Administration figures, the APIC points out, show "that motor fuel consumption during 1945 for the country as a whole increased nearly 3,000,000,000 gallons, or 16.4 per cent, over the 1944 level. In a number of states the rate of gain was much greater. For example, motor fuel consumption in 1945 rose 32.8 per cent in New Mexico, 32.5 per cent in Nevada and 26.3 per cent in Arizona. This trend of greater consumption, moreover, was consistent throughout the entire nation, with every state showing a gain of at least 11 per cent over the consumption for the previous year.

"Motor fuel consumption figures for the first five months of 1946 show that this trend is continuing in the current year," the committee adds in its Tax Economics Bulletin. "Figures for this five-month period indicate that gasoline consumption for the country as a whole ran approximately 10 per cent over the total for the same period in 1945. This impressive increase in gasoline consumption occurred despite a sharp curtailment in demand for gasoline from the federal government following the termination of hostilities. The falling off in demand from this source has been more than counterbalanced by a great upsurge in highway demand for motor fuel. In some states, such as Missouri, Florida, and Oregon, motor fuel consumption totals are currently running more than 40 per cent ahead of the 1945 level."

Noting that the greater use of motor fuel for highway purposes, as compared with over-all consumption is reflected in state gasoline tax collections, the APIC cites statistics compiled by the Tax Administrators' News showing that nationwide receipts from state motor fuel levies in the first half of the current year ran approximately 40 per cent ahead of receipts for the first six

SAVE $ and INCREASE TRACTOR POWER

The Bull-dozer Blade Nu-Edge Bar is butt-welded to new or worn blade and welding bead covered with a thin layer of hard-surfacing electrode—Affording 2000% savings in blade replacements.



BULLDOZER TRACTOR GRIP-LUGS

are easily welded to any size grouser shoe without dismantling assembly. Made of special work-hardening steel which becomes tougher with use — outwearing original grouser.

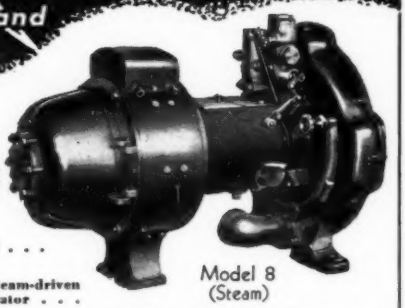
See Your Local Dealer

Send for Folder XE Today

SOLE PRODUCERS
ALLIED STEEL PRODUCTS, INC.
7835 BROADWAY · CLEVELAND 5, OHIO

HERE'S your ideal small power plant for lights, ventilating fans or other electrical equipment.

MOON Generators TURBO and BELT DRIVEN for LIGHT and POWER



Important MOON features include:

1. GOVERNOR AND COMPOUND WINDING on Steam-driven models prevent excess voltage output which might injure electrical apparatus . . .
2. ONLY 2 EASY-TO-REACH OILING POINTS . . .
3. AUTOMATIC CUT-OFF on larger capacity Steam-driven models prevents overload damage to generator . . .

Models from 1 to 7½ KW capacity.

Send now for illustrated circulars

MOON MFG. CO.
118 North Jefferson St., Chicago 6, Illinois, U. S. A.

ESTABLISHED 1893

Send in your old Moon generators for rebuilding now—we can give prompt service.

months of 1945 and more than 20 per cent higher than the total for the corresponding period in 1941.

"The resurgence of highway demand for motor fuel from its low wartime level," the APIC declares, "is all the more surprising in view of the smaller number of cars on the road. Administrative figures show that there were approximately 4,250,000 fewer passenger cars registered during 1945 than in 1941, the peak registration year.

"Two principal factors have combined to produce the situation where highway motor fuel consumption is increasing although the number of cars has declined. In the first place, passenger car travel received great impetus from the removal of wartime restrictions on motor vehicle use. Car owners, with both gasoline and the means to purchase it readily available, have been satisfying their appetite for travel on the highways, an appetite which was built up during the war years when automobile use was limited.

"Secondly, and even more important from the standpoint of future consumption of motor fuel, is the increase in gasoline used per vehicle. This represents a postwar continuation of a trend which had been in evidence for many years before the war. Year by year, Americans are putting their automobiles to greater use, both in their businesses and for recreation. From 1925 to 1941, the average gallonage consumption of motor fuel per passenger car in use rose more than 50 per cent. The war, with its attendant restrictions on motor vehicle use, brought a temporary halt to this trend, but motor vehicle owners are resuming in 1946 where they left off in 1941."

The APIC further pointed out that The Oil Marketer recently disclosed editorially that: "Statistics on gasoline consumption for the first half of the current year, indicate an average annual consumption for 1946 of 680 gallons per passenger car. This is 174 gallons more than the average for last year, 13 gallons above the 1941 record figure and 290 gallons greater than the average for 1944, low for the last decade.

"Consumption by trucks and buses is rising similarly, the 1946 full-year estimate being 1,440 gallons a vehicle, compared with 1,300 last year and 1,412 in 1941. . . ."

It was further predicted by The Oil Marketer "that gasoline consumption of cars will continue to rise, even on top of the coming great gain in auto registrations. A very conservative projection, based on data from the Bureau of Mines and the Public Roads Administration, indicates 685 gallons for 1947, 709 for 1948, 727 for 1949 and 731 for 1950."

"If these estimates materialize," the APIC observes, "the states during the next few years should be deriving from existing automotive tax rates substantially more than the $1,468,554,000 actually collected in the prewar peak year of 1941. This outlook, plus the greatly expanded federal-aid program for highways, gives assurance that there will be ample funds for needed road development and improvement within the framework of present taxes."

Oil Companies Interested in Underground Parking

By BETHUNE JONES

Possibility that some oil companies may aid in financing the cost of constructing underground parking garages, in return for the sale of gas, oil and services, was indicated recently in connection with planning for such a project in Newark, N. J.

Besides Newark, many other cities throughout the country, including New York, Memphis, Philadelphia, Detroit, Kansas City, Boston, Milwaukee and Los Angeles, have recently considered proposals for underground garages as means of easing traffic congestion. In San Francisco, which pioneered with a 1,700-car underground garage, four additional similar projects have been proposed.

Under an alternative proposal presented (Oct. 31) to the Newark Central Planning Board for financing construction of a parking garage under Newark's Military park, oil companies

BUCKET QUIZ
What material do you plan to dig or handle?
What is your crane capacity?
What are the clearances and space limitations?
Give us the answers, and we will give you details on the Blaw-Knox Bucket most efficient for the job . . . Over 100 types and sizes to choose from at Blaw-Knox—Bucket headquarters.
Shown is No. 671 Two line Lever Arm Bucket for Digging. Capacity 3/4 yd.
BLAW-KNOX BUCKETS
BLAW-KNOX DIVISION of BLAW-KNOX COMPANY
2074 FARMERS BANK BUILDING, PITTSBURGH 22, PA.

would pay advance rent to underwrite about $1,500,000 of the $2,035,000 project.

An engineering study of the proposed project was submitted formally to the planning board by Harry W. Alexander, resident planner for Harland Bartholomew & Associates. The board sent copies to the Newark City Commission pending a report by its citizens' subcommittee, which has been studying the underground garage plan.

The financing plan originally proposed in Newark was that the park area required for the garage be leased by the city at $20,000 annually to a private corporation to be formed by merchants and other citizens. The construction cost would be financed by sale of securities to business interests and amortized over a 20-year period, the property thereafter reverting to the city.

In submitting the alternative financing suggestion, Alexander said "exploratory conversations have been held with several oil companies to ascertain whether they would be interested in financing a part of the cost of the proposed garage in return for the sale of gas and oil and providing other services in the garage."

Alexander said the companies expressed a "real interest," and indicated they "might be willing to provide a substantial part of the capital cost of the improvement. That would be in the nature of a prepayment of rent in a lump sum which could be used by the operating company as capital for construction of the garage."

Such a lump sum payment would be equivalent to a rental of $50,000 annually for 30 years, Alexander said, amounting to about three-fourths of the construction cost and leaving only $500,000 to be obtained from other sources.

Alexander further estimated that the alternative method would cut payrolls from about $179,500 a year to about $152,700, and would reduce carrying charges "tremendously." Total operating expenses would be cut from an estimated $508,310 to about $228,650, he said, and the annual net profit would come to $77,530 instead of $40,896 as indicated in the original estimate.

He suggested that if such an arrangement is worked out with the oil companies, the city might share in the profits in addition to receiving the annual ground rent.

Report Declares La Guardia Airport Needs Repairs

An engineering report warning New York City that urgent repairs essential to "continued safe operations" at La-Guardia Field would have to be undertaken immediately was made public by Commissioner Frederick G. Reinicke of the City Department of Marine and Aviation.

Prepared by Madigan-Hyland, engineers, the report warned that the Administration at the airport was settling at a rate which, unless stopped, might "render the building unsafe for occupancy." It described sections of runways and taxi loops as in "relatively unsafe condition."

It was asserted that by early 1948 the field would have to be closed entirely for $12,000,000 in rehabilitation work if it is to be saved from the ever-reaching fingers of high tides edging in from Bowery Bay and Flushing Bay. The alternative to such reconstruction, the report warned, would be to abandon the $60,000,000 airport.

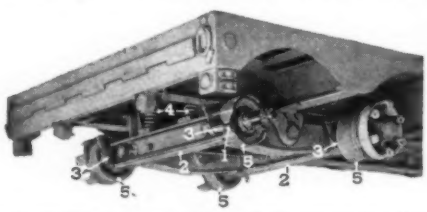
The engineers found that some portions of the field have sunk as much as six feet since 1939. This settling prob-

MEMO
TO ALL CONSTRUCTION SUPTS.:—
Have we been taking "Buckets" too much for granted? What about HAISS high power ratio 7:1
J. J. B.

For Catalogs, Prices, Deliveries Write or Wire
HAISS
HI-POWER BUCKETS
GEORGE HAISS MFG. CO., INC., 144th Street & Park Ave., New York 51, N. Y.

Be sure your next trailer has ALL these features.

Deep, wide flange main beams running the full length of the trailer, I-Beam sections for cross-members and outriggers, improved, fabricated gooseneck, and *all* electric-welded construction. Look at all the other features found only on Jahn tandem axles: (1) constant lift cam, (2) two full-width axles attached to longitudinal rocker beams, (3) worm gear type slack adjusters at each wheel, (4) heavy coil springs at each axle and (5) positive equalizing braking at each wheel regardless of position of axle.



C. R. JAHN COMPANY
1349 West 37th Place, Chicago 9, Illinois
Heavy duty trailers from 5 to 100 tons.

JAHN TRAILERS ALL OVER The WORLD!

lem can be reduced by 75 per cent within 10 months after the field is closed, according to the report, which estimated the whole rehabilitation program will take no longer than a year. But pending the opening of Idlewild, expected next June 1, badly overcrowded conditions at both LaGuardia and Newark Airports will permit only an estimated $1,700,000 in emergency work.

LaGuardia Field's settling troubles have been long known and much publicized. The Madigan-Hyland report points out that the city purchased the 105-acre North Beach Airport in 1936 when it was approved as a WPA project. It was extended to its present 558 acres by filling in beyond the then existing shoreline of Flushing Bay.

Approximately 12,000,000 cu. yds. of materials, principally cinders and ashes, were transported over timber trestles from Ricker's Island and dumped on top of the soft tidal silt deposits of Flushing Bay. Several million additional cu. yds. of sand fill also was used. Runways, taxi strips and the apron were constructed directly on the filled ground soon after it reached the required grade. Hangars and other buildings were supported by piles—those for hangars in the filled sections east of the Administration Building being driven through the cinder fill and underlying silt into a deep sand stratum some 80 feet below the surface. But, according to the Madigan-Hyland report, driving records of the Administration Building piles indicate that they probably did not reach a stratum which would provide satisfactory bearing capacity.

Rather than attempting to stop settlement at the field, the engineering report proposes to accelerate it. During the last seven years, the survey reported, a load of fill averaging 26 feet has been superimposed upon the layer of silt, estimated at 60 feet thick. The silt is like a sponge, its water content ranging up to 120 per cent in comparison to the solid fill above.

As more and more fill has been piled on, it has formed the water content out of the silt, causing further sinkage, but the engineers estimate that it will require 50 years before the field will become stable if the drainage is left to nature. They propose to drill "filter wells" into the field. The wells would be large holes filled with sand or similar material which would accelerate drainage. The drainage ability of the wells would cause a more rapid flowing off of water in the silt section.

The engineers expressed belief that in this manner 85 per cent of the field's settlement could be hurried within 10 months. Then more fill could be hauled in to bring it back to an elevation above high-tide sweeps, runways could be reconstructed and the field returned to air use.

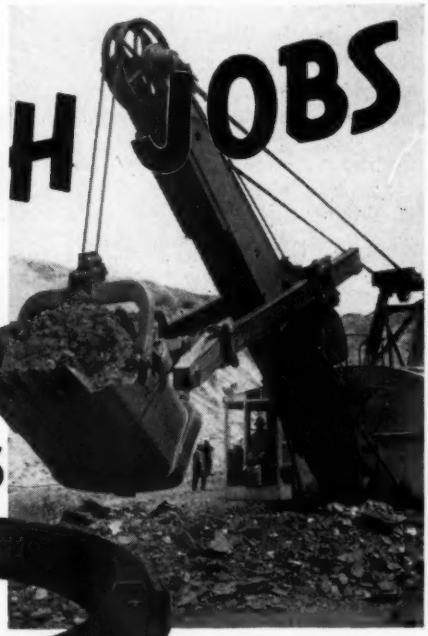
Pointing out that it would be impossible to continue to pile more grading on the runways as they sink, the report warned that the weight of the asphalts and new fill might lead to ultimate failure, causing slides of the water-filled soft-silt stratum into the bay. The filter-well project would cost an estimated $10,000,000.

Construction Machinery Second Quarter 1946

Shipments of construction machinery during the second quarter of 1946 were valued at $76.1 million, according to a report released by the Bureau of the Census. These shipments were about 19 percent higher than the first quarter shipments valued at $64.1 million, and brought the shipments to about the level of the fourth quarter of 1945.

All the major types of construction machinery increased during the quarter. Shipments of power cranes and shovels showed the largest increase from $16.7 million in the first quarter of 1946 to $19.8 million in the second. Other large increases were reported for mixers, pavers, and related equipment which advanced from $5.0 million to $7.9 million; for dozers, from $3.9 million to $5.7 million; and for tracklaying tractors, from $15.8 million to $17.6 million. Road construction and maintenance machinery and miscellaneous construction machinery increased by smaller amounts, from $17.5 million to $18.4 million, and from $5.2 million to $6.6 million, respectively.

For TOUGH JOBS GATKE SWING FRICTIONS



GATKE Moulded Asbestos Swing Friction. Made in all shapes and sizes.

GATKE
Brake Linings, Clutch Facings and Frictions

for all Excavating, Road Building and Contractors' Equipment.

Replacements for popular models carried in stock.

TREMENDOUS POWER — for effortless control—no let down when things get hot.

SMOOTH ACTION—for precision handling—no grabbing or chattering.

LONG WEAR LIFE beyond comparison.

These are a few of many extra performance values that help keep production high and maintenance low.

Whatever the equipment or service, send details and dimensions for the GATKE Recommendation.

GATKE CORPORATION
232 N. La Salle St., Chicago 1, Ill.

NOT in the *Contract*

Overheard in the theater lobby; "He says to me, "I wonder if you could melt in my arms," but I says to him, "Nothing doing, I'm not that soft and you're not that hot."

The explorer, bowing low, approached the savage chief.

"I come to you from beyond the sunset, from the Great White King—"

"Tell me," interrupted the chief, "why don't you guys do something about the rotten radio programs you send over here?"

Father: "Now, children, tell me who has been the most obedient during the last month and done everything mother asked him to."

Children (in unison): "You, daddy."

The portly Negro woman was the mother of fifteen children and was expecting the sixteenth. At a loss as to what name she should give to the new arrival, she consulted the dictionary, and after much deliberation she decided to call the baby "Opium."

Speculation naturally arose as to the reason for this choice. When asked for an explanation, she replied:

"I looked in the dictionary, and there it was — 'Opium — from a wild poppy.' "

"I hear you've been to a school for stuttering. Did it help you?"

"Peter Piper picked a peck of pickled peppers."

"Wonderful!"

"Yep, but it's d-d-darned hard to w-w-w-work into an ordinary c-c-c-c-c-conversation.

"Which one of you is the crane operator?"

The young man was consulting the psychiatrist about the strange new love that had come into his life. The young man said that he was in love with his milk man's horse—that he had first noticed the horse's beautiful red mane, and now each morning as the clop clop of the horse's hoofs came into his hearing, his heart swelled with love.

The psychiatrist, among other questions, asked: "Tell me, is this horse a male or female?"

The indignant answer was: "Why, female, of course. What do you think I am—queer?"

"Say, Bud, what makes you so jumpy? I've noticed that every time you hear an auto horn you cringe and look up terrified. Are you afraid of being hit?"

"Heck, no! It's just that last week a man ran off with my wife in an automobile and every time I hear a horn toot, I'm afraid he's bringing her back."

A young business man, a deacon in his local church, while in New York on business was to purchase a new sign to be hung in front of the church. He copied the motto and dimensions, but when he got to New York discovered he had left the paper behind.

He wired his wife: "Send motto and dimensions."

An hour later the reply came in and the new girl, who had just come on duty, read it and fainted. The message read: "Unto Us a Child is Born, 6 feet long and 2 feet wide.

Sam's roadster skidded around the corner, jumped in the air, knocked down a lamp post, smacked three cars, ran against a stone fence and stopped. A girl climbed out of the wreck.

"Darling," she exclaimed, "that is what I call a kiss!"

Two "white wings" were seated on the curbstone of a one-horse town discussing a comrade who had died the day before.

"Bill certainly was a good sweeper," said one.

"Ye-es," conceded the other thoughtfully, "but don't you thing he was a little weak around the lamp posts?"

Harvey County

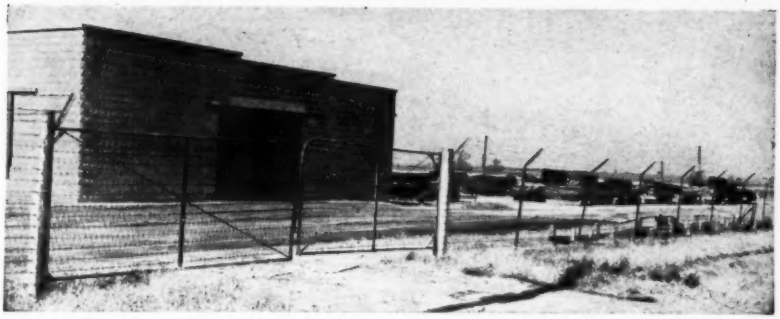
(Continued from page 20)

nel by the Dozer-Shovel. Dirt excavated from the channel is then dozed over the pipe and tamped by running the machine over the loose dirt. Where sections of the culvert trench are inaccessible for tamping by the tractor crawler treads, the down pressure on the bucket is used for this purpose. The Dozer-Shovel can easily set two culverts a day, completing the entire operation. According to Engineer Mills the machine can be used advantageously for excavating concrete box culverts. It can turn and dump dirt along the shoulders, making the backfilling with the Dozer-Shovel an easy operation.

The machine is hauled to various job locations on a trailer pulled by the Walters truck. When it is used alternately for digging and dozing, the bucket is used for both purposes to save time of frequently interchanging bucket to bulldozer blade.

Although road construction and maintenance is the principal work of the Dozer-Shovel it is also used for fill-in jobs, especially in winter when there is no road work. These fill-in jobs include loading, snow removal and lifting heavy timbers, etc. This machine was purchased primarily as a loader, digger and bulldozer and did not replace any other type of equipment then being used for this work by the county.

Figured on the basis of 1,000 hours of use for the first year of ownership it was estimated by Harvey County officials that the Dozer-Shovel cost 85c an hour to operate. The estimate includes fuel, repairs and depreciation at a 10-year rate. Ten years was figured as the life of the machine for estimating depreciation costs because the same operator is kept on the Dozer-Shovel, the best fuel is always used, and the machine is serviced daily before operations begin. Oil changes are made every 200 hours and lubricating instructions furnished by the manufacturer are strictly followed. Repair parts for the first 18 months of operation have been less than $50.



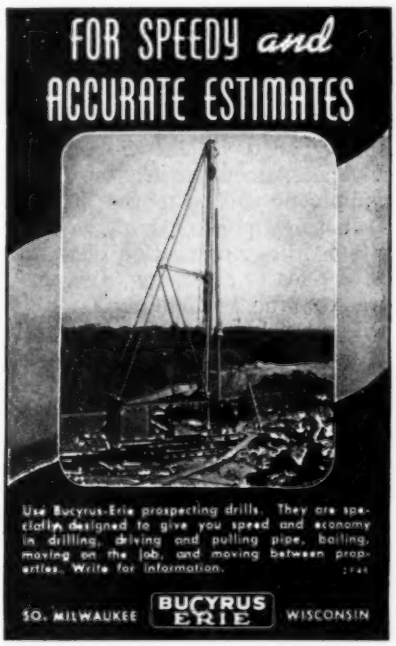
• Cement and hardware storage building at county shop site. Lumber storage racks are in fenced-in yard.

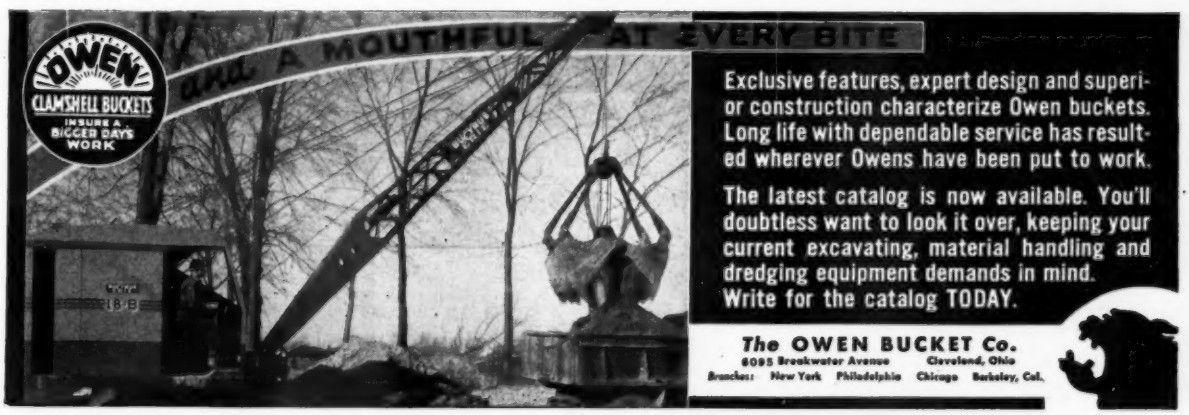
Coal Handling Project

(Continued from page 21)

The project called for three one-mile supply tracks to serve the washing plant. This meant building up an extension of the high embankment to provide a subgrade for the tracks. Some 100,000 cu. yds. taken from nearby borrow pits were needed to build up the extension. It was rubber-like river bottom silt which required lots of power to loosen and move up the steep inclines.

The contract for this work was held by Smith Construction Company of Huntington, W. Va. Equipment used on the job included seven International diesel crawler tractors, three equipped with scrapers varying in capacity from six to ten cu. yds. and four equipped with Bullgraders.


FOR SPEEDY and ACCURATE ESTIMATES
Use Bucyrus-Erie prospecting drills. They are specially designed to give you speed and economy in drilling, driving and pulling pipe, boiling, moving on the job, and moving between properties. Write for information.
SO. MILWAUKEE
BUCYRUS ERIE
WISCONSIN


OWEN
CLAMSHELL BUCKETS
INSURE A BIGGER DAY'S WORK
and A MOUTHFUL AT EVERY BITE
Exclusive features, expert design and superior construction characterize Owen buckets. Long life with dependable service has resulted wherever Owens have been put to work.
The latest catalog is now available. You'll doubtless want to look it over, keeping your current excavating, material handling and dredging equipment demands in mind. Write for the catalog TODAY.
The OWEN BUCKET Co.
6085 Breakwater Avenue Cleveland, Ohio
Branches: New York Philadelphia Chicago Berkeley, Cal.

• One of two shaker and vibrator type separation plants for earth, gravel and rock built by McCoy Co. This plant is located 2,000 yds. east of the dam, between borrow pits No. 1 and No. 3.

Granby Dam

(Continued from page 16)

ion in Denver. At present they are using about 150 men on two shifts per day. As the project advances, more men and more equipment will be moved in.

Just one mile south of the dam site is the construction office of L. J. Hesser Company, the contractor who is building Granby Dikes 1, 2, and 4. This company is using six Super C Tournapulls and four D8 Caterpillars. They are moving dirt from their borrow pit to Dike 4, which they are now constructing. By a special hook-up between tractor and scraper at the borrow pit, they are able to load each scraper in from 20 to 35 seconds per vehicle as timed by stopwatch. This special coupling was developed by Carl F. Folger, project superintendent for Hesser, and was manufactured by the F. W. McCoy Company.

There will be no relocation of railroads and the highway will not be affected until the Granby Dam is at full reservoir. The contract for relocation will be let at a later date.

The Bureau of Reclamation has plans for two other projects which also will increase the water supply for the eastern slopes of Colorado, and contribute an enormous amount of electrical power. South of Denver is to be the Blue River-South Platte diversion tunnel, which will run 22 miles under the Continental Divide and will bring western slope water into the Missouri Basin to irrigate 450,000 acres on the eastern slope. It will require five reservoirs on the west slope plus two more on the east slope southeast of Denver. There will be six hydroelectric plants which will generate one-and-one-half billion kilowatts of electric current a year. Any excess water not used for irrigation will enter the big flood control reservoir that the army engineers are building on Cherry Creek south of Denver.

The second project is to be the Gunnison-Arkansas Diversion tunnel, located farther south where the Gunnison River will be diverted through a tunnel under the Continental Divide into the Arkansas River, in the mountains above Pueblo. This project will have numerous hydroelectric plants strung along the eastern slope of the Continental Divide, and will produce an estimated two and one half billion kilowatts of electric energy yearly. This project would lift and store 800,000 acre-feet of water from the Gunnison on the western slope.

The huge electrical output from these three projects, including the Big Thompson, is expected to have a powerful influence upon industrial expansion in Colorado, and the irrigation of the land, which is the primary object, is certain to raise this state's economic level.

Road Machinery

(Continued from page 17)

and was used for single carriages. The Iter was for horsemen, pack animals, and pedestrians and was three feet wide. The Semiter was 18 inches wide. The Callais was a mountain pass.

Criminals and Roman soldiery were employed to build Roman roads in England in the second, third and fourth centuries.

Roman military roads were made with four strata with composite thickness of about three feet. The statumen consisted of two courses of flat stones laid in mortar; the sudus was a rubble of broken stone mixed with one-third the quantity of quicklime well rammed. The nucleus was a mixture of brick, broken tiles and one-third the quantity of lime or gravel, and the stated proportion of lime laid on while hot from slaking.

Highways were first made public in England by the Romans. Edward I ordered the roads widened and cleared of trees within 200 ft. of the road to prevent robberies.

The road built by Napoleon, from Geneva to Milan, cost the French government $3,250,000.

small ROGERS TRAILERS too ... embody

EXPERIENCE builds 'em
PERFORMANCE sells 'em

Rogers' time proven features of fundamental design which have been tested under all kinds of severe conditions.

In any Rogers Trailer the purchaser obtains the maximum in construction features, in ease of handling, in safety and all 'round operation.

ROGERS BROTHERS CORPORATION
136 ORCHARD ST., ALBION, PA.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

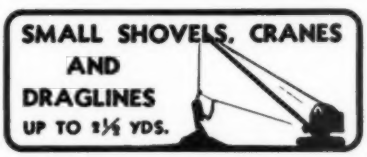
TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

2—Lorain No. 95 draglines with 2½ cu. yd. buckets.
3—Lorain No. 30 draglines with ⅝ cu. yd. buckets.
All in excellent condition. Box 3195.

Immediately available 80 ft. boom stripping shovel type crane, caterpillar mounted, electric, good condition, subject inspection, central location. Box 3186

Bucyrus 175-B Steam Shovel. Serial No. 1478, 3½ cu. yd. dipper, 48' dipper stick, 75' boom, 20' diameter circle rail, hoist engine 12" x 14", boom and swing engines 8" x 8", railroad truck type mounting, 4 trucks, 30" gauge 17' 6" center. The machine is equipped with oversize mother hubbard railroad locomotive boiler with large fire box for lignite fuel, 135 lbs. steam. The boiler may require some new flues. The machine had $21,000 rebuilding since last used. In first class mechanical condition. Shipping weight 200 tons. Located adjacent to railroad track. Dismantling and loading estimated 6000 man hours. Common labor 50c per hour. Billing point intrastate—Sandow, Texas, interstate—Marjorie, Texas. Price as is $3500.

Bucyrus 320-B Steam Shovel. Serial No. 4212, 8 yd. dipper, 74' dipper stick, 85' boom, railroad truck type mounting, standard 320-B Johnson Brothers boiler. New center casting and one-half set new flues included. Machine needs some repairs which can be made easily during erection. Located adjacent to railroad tracks Sandow, Texas. Billing point intrastate—Sandow, Texas, interstate—Marjorie, Texas. Price $6000 as is. Box 3185



One ⅝ yd. 1940 Bucyrus-Erie 10-B with clam, drag, backhoe, and shovel attachments. Box 3193.

Complete backhoe attachment for Bucyrus-Erie 29-B. Excellent condition. Box 3196.

Used shovel front ends complete for Bucyrus-Erie 33-B and 37-B machines. Good condition. Both front ends located near Chicago. Heckett Corporation, Butler, Pa.

One set 54"x20" Garfield type crushing rolls complete with two 96" diameter x 15½" face pulleys. Capacity, 200 tons per hour with a 1" feed and a ½" product. Rolls built by Allis-Chalmers in 1931 and weigh approximately 109,000 lbs. Price $9,000 net F.O.B. Coleraine, Minn., without motors or controls. Box 3197.

For Sale—

SHASTA DAM
AGGREGATE PLANT AND
CONVEYOR EQUIPMENT

INCLUDING:

Late model GE motors, 200 hp., 1800 rmp., 2300/4000 volt, slip ring; complete with interlocking controllers.

Western gear reducers, 200 hp., 40 to 1 ratio, herringbone gears.

Dorr hydroseparator, 20' x 4', complete with drive unit.

8", 16" and 20" deepwell turbine pumps and one 3" x 4" two stage high head centrifugal pump. All complete with motors.

30" Bodinson tripper and trestle.

Misc. electrical equipment and supplies.

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

One complete dragline front end for Bucyrus-Erie 51-B diesel shovel, including 80' boom, fairleads and 2½ cu. yd. type "AX" dragline bucket. This equipment used about 2500 hours. Located West Virginia. Box 3189

Clamshell and Dragline Buckets New and Used—We Have the Bucket For Your Job.
Phone — Wire — Write
THE BUCKET MART
1150 North Branch Street
Chicago 22, Illinois
Phone Michigan 1515

---

1 Bucyrus-Erie 37-B shovel front complete with boom, dipper sticks and bucket with all parts as taken from 37-B machine 25018. Condition excellent. Box 3192

New
DERRICKS
(ALL-STEEL, STIFF-LEG)
7 Available!
From U S. Government Surplus. 30 Ton at 38 ft. radius; 60 ft. Boom with Bull Wheel.
Priced At a Saving!
■
FURNIVAL MACHINERY COMPANY
5405 Lancaster Ave., Phila. 31, Pa.
TRinity 7-5200

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—⅝ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1¼ cu. yd. Drag Shovel Dipper—38-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper 42-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type 1V Medium Duty Dipper 100-B.

F.O.B. Works
Write for any further information desired
BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

International diesel No. I-9 rubber-tired tractor, like new. Dual rubber on rear. Box 3194.

Complete new fairlead for Bucyrus-Erie 54-B. Located in Seattle. Will consider any reasonable offer. Box 3191

PAGE DRAGLINE BUCKET ONE CU. YD.
Excellent condition $350.00

Surplus, New Wire Line Improved Plow Steel, ¾" size 6 x 19 reg. lay. 1000' or 1100' reels at 18c ft.

G. W. Kaufman
Markley Road, Cincinnati 30, Ohio

Surplus Hydraulic Press Stock Available For Immediate Shipment.

3 Beco Portable Hydraulic Presses — 100 tons capacity consisting of: Press cylinder (ram), 4 speed pump with high pressure globe valve, 5' 0" high pressure hose, 5' 0" oil return hose.
2 100 ton Press Frames, including:
1 Frame head
1 Cylinder back plate
4 Alloy steel back plate rods, 1" x 20" with 8 nuts
1 Frame base with tie rods and nuts
4 Alloy steel frame rods 1" x 48" with nuts
1 Frame for track repair work consisting of:
1 Special back plate
8 Rods with nuts to attach press cylinder to track press frame
2 pcs. 10' 0" High pressure hose with fittings for 100 ton Press.

Bucyrus-Erie Company
South Milwaukee, Wisconsin

Surplus Swivel Hook Double Sheave Blocks

2 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheave bushed with self lubricating bronze bushings, grooved for ⅝" rope. Groove diameter 12¼" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 234 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.

1 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheaves bushed with self-lubricating bronze bushings. Grooved for ¾" rope. Groove diameter 10½" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 235 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.

2 40 ton "American" 24" swivel hook double sheave block diamond pattern with cast steel sheaves grooved for ⅞" rope. Sheaves to be bushed with plain bronze bushings, with center bored sheave pin and ¼" Alemite hydr. grease fitting No. 1980 equipped with 300 lb. cheek weights and 5½" swivel hook. Total weight of block 1190 lbs. Dwg. BEFP 1-M-6560.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

(For Sale continued on page 48)

For Sale

(Continued from page 47)

New

BUCYRUS - ERIE PARTS!

From U. S. Govenment Surplus

Parts For: 15B, 20B, 22B, 33B, 37B, 54B, and 120B. Also: Gears, Pinions, Bearings, Bushings, Lining, etc.

Immediate Delivery From Available Stock. . . . At a Savings While They Last !

FURNIVAL Machinery Company

5405 Lancaster Ave., Phila. 31, Pa.
TRinity 7-5200

---

1 Allis-Chalmers HD-14 tractor, 1941 model, with double drum power unit and 10' Buckeye cable control bulldozer. Good condition and with some new parts.
1 Western Iron Works model 5 rooter.
1 Le Tourneau LP 12 yard cable control scraper. In perfect condition. One extra tire.
All of the above equipment is available for inspection 10 miles south of Marshall, Texas, on Highway 31. E. F. Bolander, Box 229, Marshall, Texas. Superintendent.

McAlester Fuel Company—Box 783
McAlester, Oklahoma—Phone 505

ENGINEERS AND MECHANICS step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully Illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 days' Free Examination. Send No Money. Nothing to pay postman.

- ☐ Marine, $4
- ☐ Machinist, $4
- ☐ Shipfitter, $1
- ☐ Radio, $4
- ☐ Diesel, $2
- ☐ Mathematics, $2
- ☐ Sheet Metal, $1
- ☐ Blueprint, $2
- ☐ Electricity, $4
- ☐ Welders, $1
- ☐ Plumbers, $6
- ☐ Carpenters, $6
- ☐ Auto, $4
- ☐ Refrigeration, $4

If satisfied you pay only $1 a month until purchase price is paid.

AUDEL, Pub., 49 W. 23rd St., N. Y. 10, N. Y.

---

1 Used 80 H.P. Crawler Cletrac (gas) $2500.
2 Used 7-Yd. Continental Scrapers $2500. ea.
1 Used 12-Yd. Austin Western Scraper $2500.
2 Used Model L — Allis-Chalmers Tractors — 70 H.P. $2500 each.
1 Used 42" Austin Elevating Grader with Power Take-Off $500.

Box 3193

EXCHANGE

Exchange — Byers ¾ yd. model 83 Caterpillar diesel equipped crawler crane with 30 ft. boom for larger diesel equipped crawler crane.

Newport Industries, Inc.
De Quincy, Louisiana

EQUIPMENT WANTED

Wanted complete shovel front for 1943 2½ yd. Northwest. Complete shovel front for ¾ yd. K25 Link Belt. Box 3190

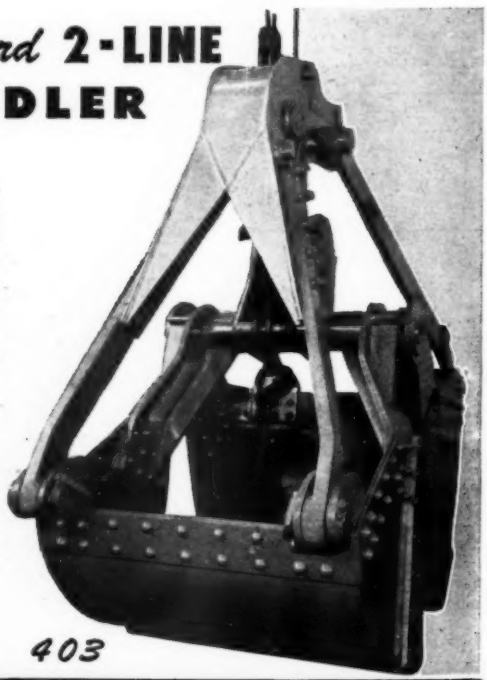
---

1 cubic yard steam dragline, Bucyrus Model 30-B or 31-B preferred. Address E. L. Morris, R. R. No. 1, Lees Summitt, Missouri.

WANTED
ONE SHOVEL
10 to 30 Yd.

Box 3184

ERIE *Standard* 2-LINE REHANDLER



THIS compact Lever Arm Rehandler Bucket of normal proportions has ample closing power to fill to capacity in compact materials, and is so designed that the reeving can be adjusted to obtain maximum speed with capacity grabs in loose materials. We have reduced the "height open dimension" thus requiring minimum headroom, enabling you to pile higher and to discharge into higher hoppers. Lighter weight alloy construction provides more pay load (scoop contents) less bucket dead weight. To see this bucket in all detail write for bulletin 403.

● *Write for Booklet 403*

ERIE BUCKETS • *A Complete Line*

Erie Steel Construction Co., 471 Geist Rd., Erie, Pa.

BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

Notes from the manufacturers

Independent Pneumatic Tool Co., Chicago, has appointed J. A. Hill as manager of electric tool sales. W. C. Rush was named manager of the newly opened branch office in Cincinnati.

Allied Steel Products, Inc., Cleveland, Ohio, announces the appointment of Mr. John G. Fitzpatrick as direct factory agent in the territory consisting of Ohio, Indiana, Illinois, and Michigan.

Caterpillar Tractor Co., Peoria, Ill., has appointed M. A. Clements as Service Manager for their Western Division.

New trade literature

Title: Guide to the Selection of Conveyor Belt Grades

Subject: The publication discusses differences in various grades, outlines the reliable measurements of qualities in various types of belts and services for which they are commonly applied. Description and data, as well as the ordinary uses for each of its conveyor belt grades, together with those for special constructions, are also contained in the guide.

Where to Get: B. F. Goodrich, Akron, Ohio (Free)

Title: How to Build Your Own Gas Drive Welder

Subject: How to build your own gasoline-driven arc welder, much of it from "scrap" materials, is the subject of this attractive 48-page booklet which is filled with pictures and diagrams and actual working explanations. The book takes the reader through a progressive step by step plan in the construction of the welder.

Where to Get: The Hobart Brothers Co., Troy 1, Ohio. Ask for EW-113 (Free)

Title: "1946 Twecolog"

Subject: The complete line of Tweco cable connections is illustrated in a 12-page booklet that gives the specifications and a description of each article.

Where to Get: Tweco Products Company, Wichita 7, Kansas (Free)